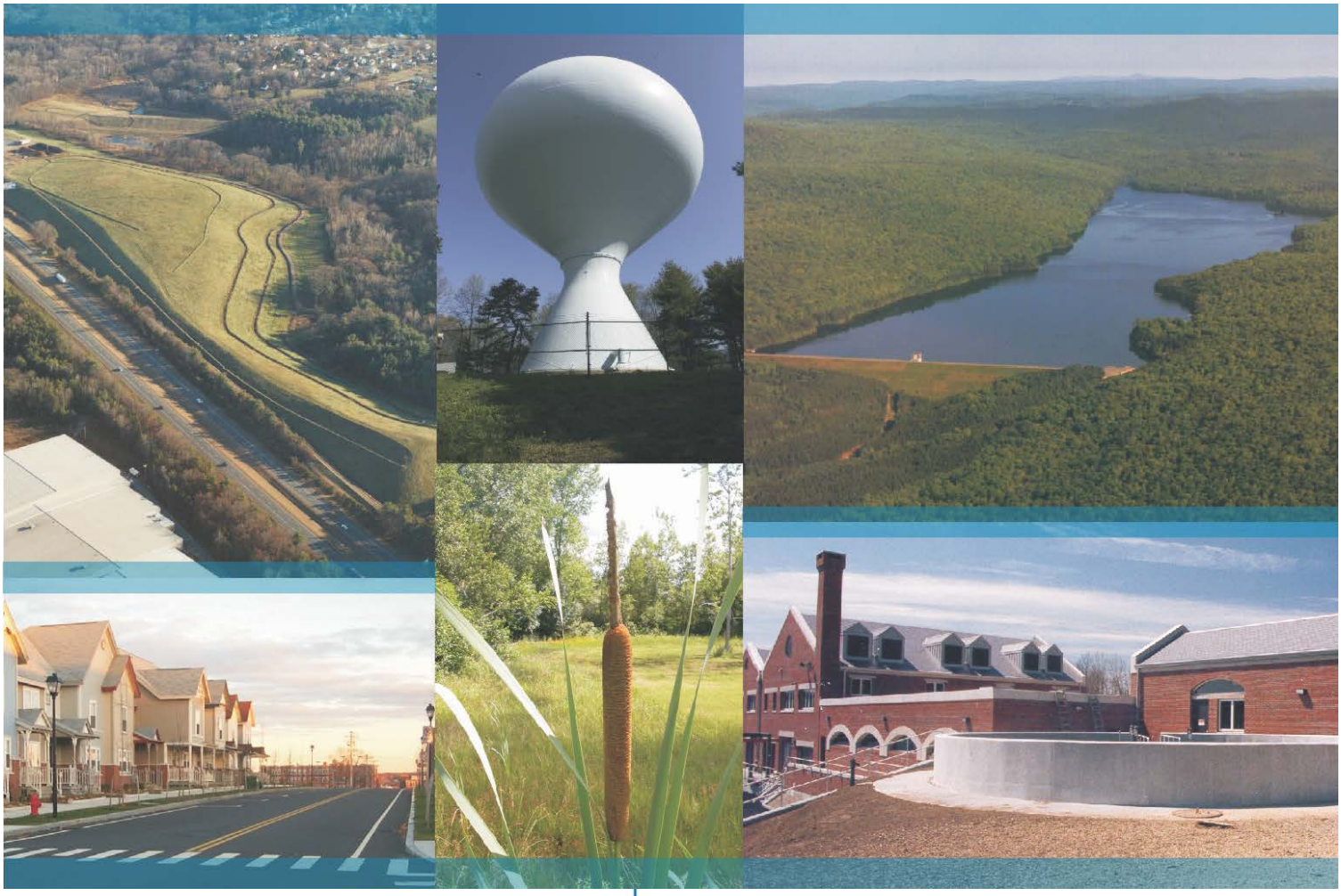


Tighe&Bond

Corbin Block Development
Darien, CT

# Supplemental Engineering Report

Prepared For:

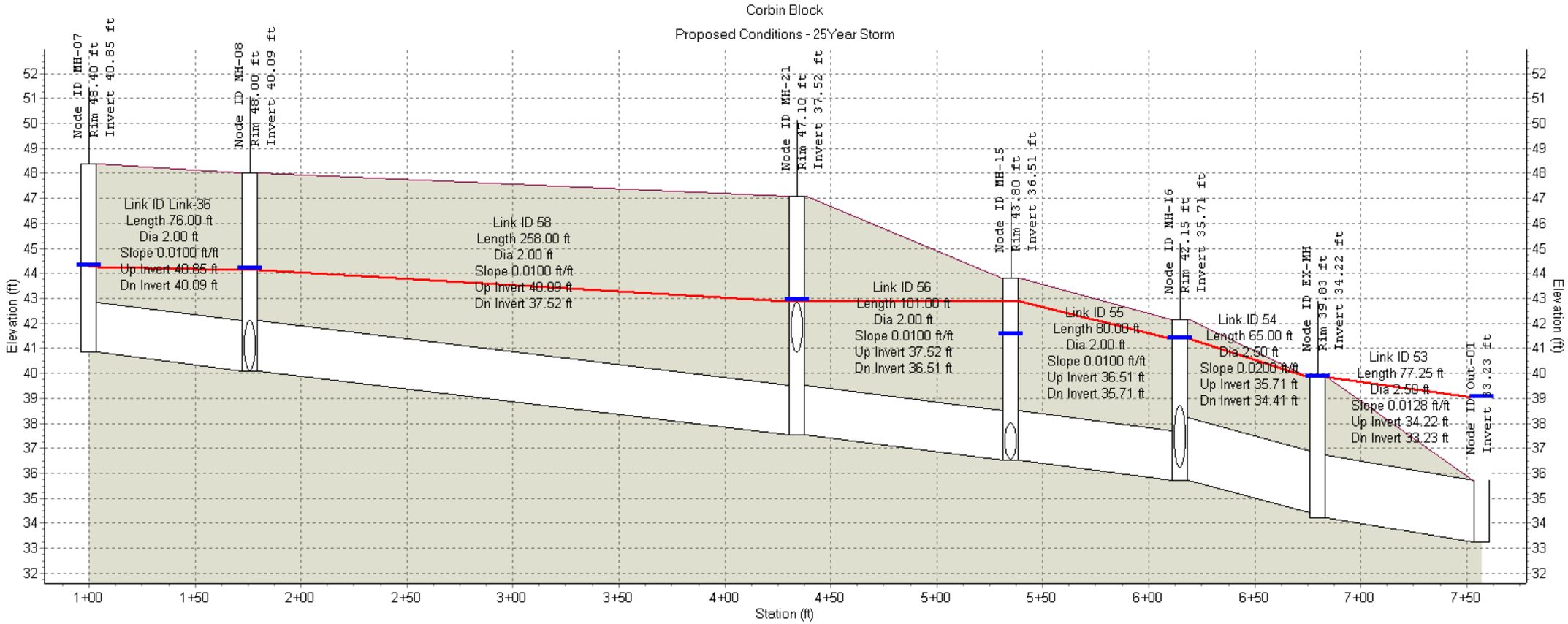
**Baywater Corbin Partners, LLC**
**Darien, CT**

May 25, 2018
Revised August 30, 2018

**Corbin Block Development - Supplemental Engineering Report**

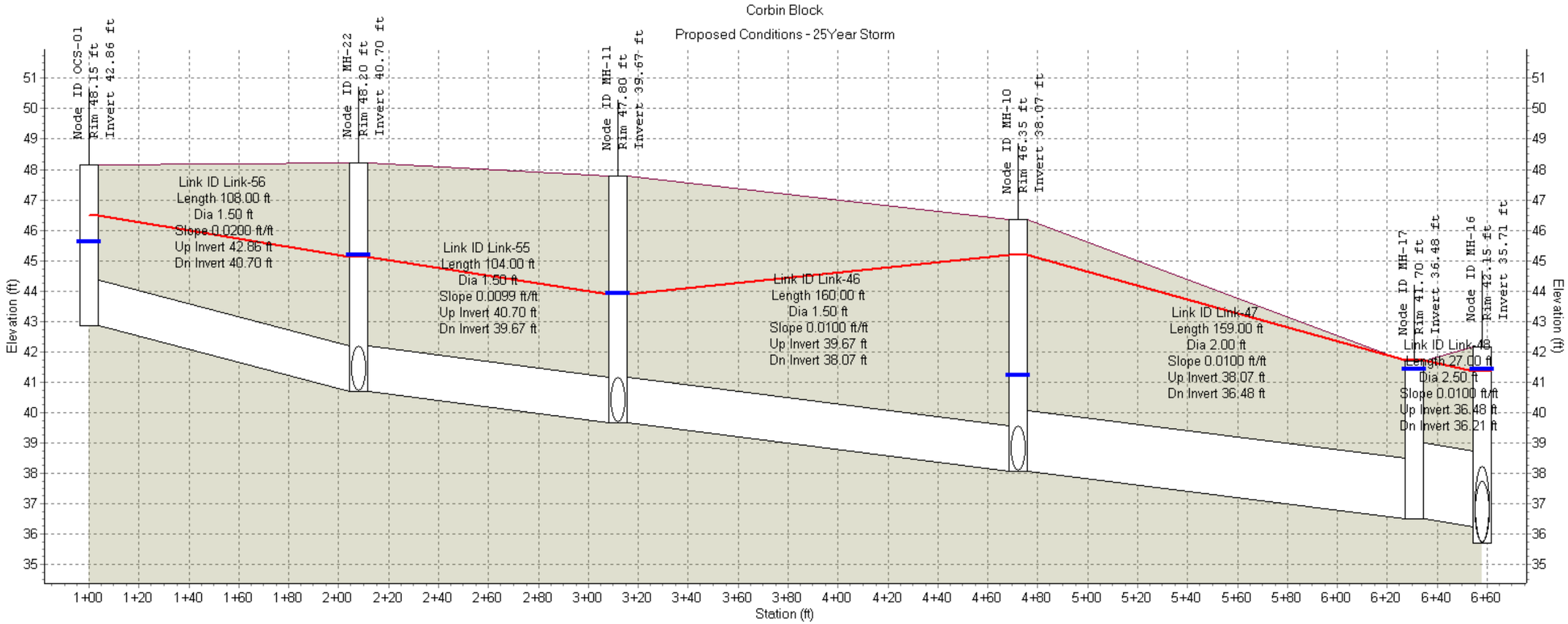
Tighe&Bond

# ATTACHMENT A



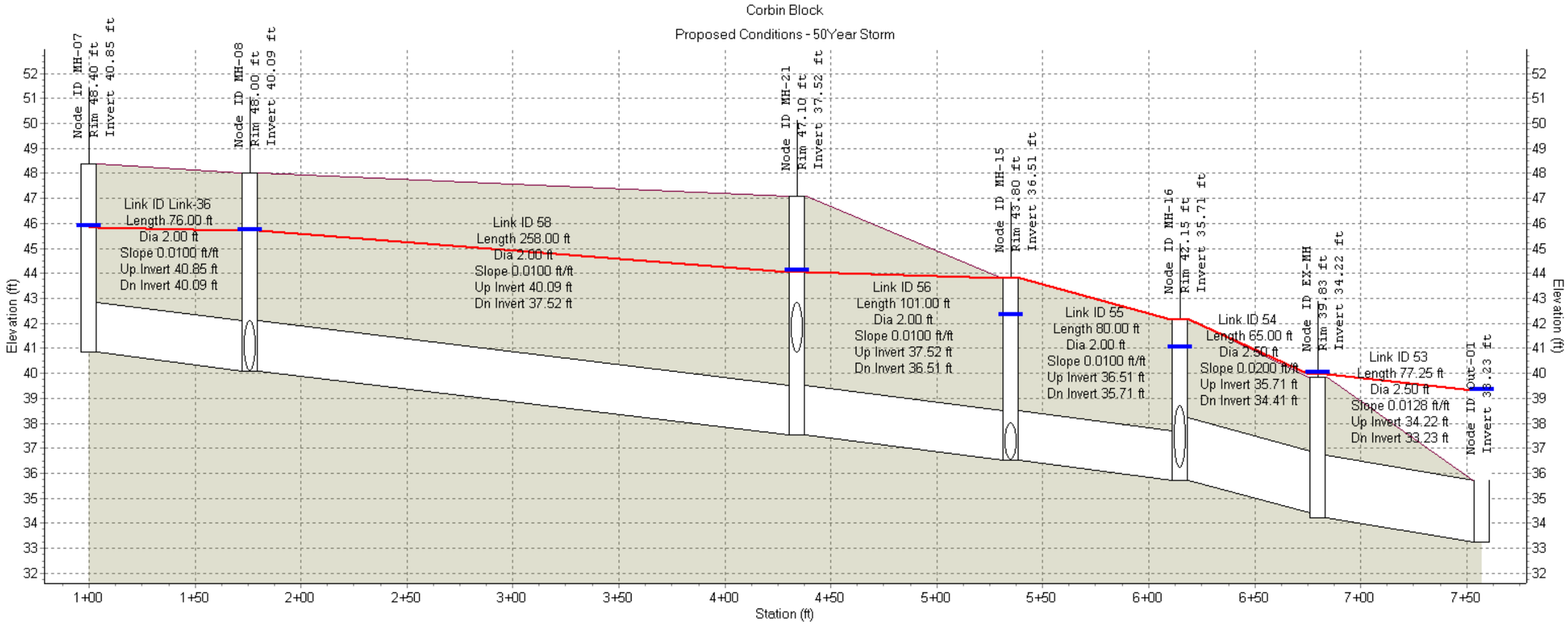

| Node ID: | MH-07 | MH-08 | MH-21 | MH-15 | MH-16 | EX-MH | Out-01 |
|---|---|---|---|---|---|---|---|
| Rim (ft): | 48.40 | 48.00 | 47.10 | 43.80 | 42.15 | 39.83 | |
| Invert (ft): | 40.85 | 40.09 | 37.52 | 36.51 | 35.71 | 34.22 | 33.23 |
| Min Pipe Cover (ft): | 5.55 | 5.91 | 4.28 | 5.29 | 3.44 | 2.92 | |
| Max HGL (ft): | 44.2600 | 44.1500 | 42.8700 | 42.8700 | 41.3700 | 39.8300 | 39.0200 |

| Link ID: | Link-36 | 58 | 56 | 55 | 54 | 53 |
|---|---|---|---|---|---|---|
| Length (ft): | 76.00 | 258.00 | 101.00 | 80.00 | 65.00 | 77.25 |
| Dia (ft): | 2.00 | 2.00 | 2.00 | 2.00 | 2.50 | 2.50 |
| Slope (ft/ft): | 0.0100 | 0.0100 | 0.0100 | 0.0100 | 0.0200 | 0.0128 |
| Up Invert (ft): | 40.85 | 40.09 | 37.52 | 36.51 | 35.71 | 34.22 |
| Dn Invert (ft): | 40.09 | 37.52 | 36.51 | 35.71 | 34.41 | 33.23 |
| Max Q (cfs): | 8.18 | 16.82 | 24.09 | 24.09 | 47.85 | 58.94 |
| Max Vel (ft/s): | 6.44 | 5.35 | 7.67 | 7.67 | 9.88 | 12.02 |
| Max Depth (ft): | 2.00 | 2.00 | 2.00 | 2.00 | 2.50 | 2.50 |



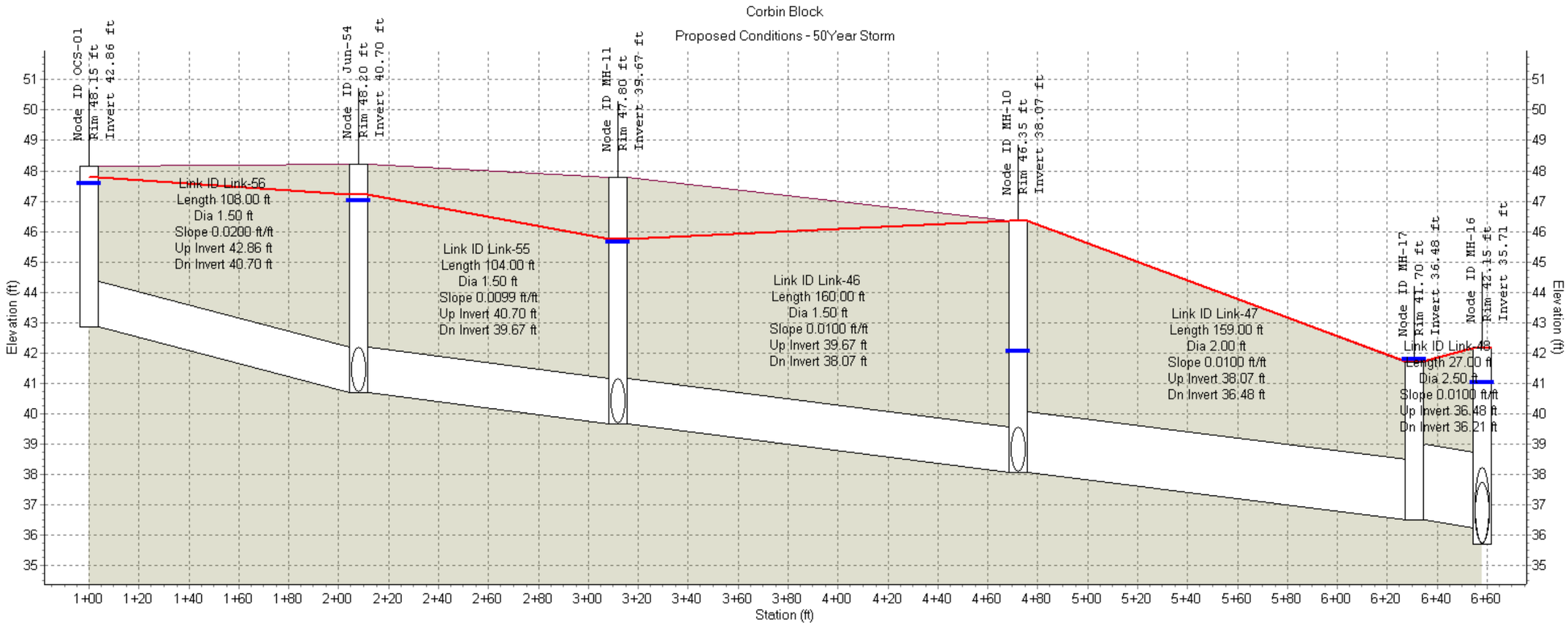

| Node ID: | OCS-01 | MH-22 | MH-11 | MH-10 | MH-17 | MH-16 |
|---|---|---|---|---|---|---|
| Rim (ft): | 48.15 | 48.20 | 47.80 | 46.35 | 41.70 | 42.15 |
| Invert (ft): | 42.86 | 40.70 | 39.67 | 38.07 | 36.48 | 35.71 |
| Min Pipe Cover (ft): | 3.79 | 6.00 | 6.63 | 6.28 | 2.72 | 3.44 |
| Max HGL (ft): | 46.4700 | 45.1300 | 43.8900 | 45.1900 | 41.7100 | 41.3700 |

| Link ID: | Link-56 | Link-55 | Link-46 | Link-47 | Link-48 |
|---|---|---|---|---|---|
| Length (ft): | 108.00 | 104.00 | 160.00 | 159.00 | 27.00 |
| Dia (ft): | 1.50 | 1.50 | 1.50 | 2.00 | 2.50 |
| Slope (ft/ft): | 0.0200 | 0.0099 | 0.0100 | 0.0100 | 0.0100 |
| Up Invert (ft): | 42.86 | 40.70 | 39.67 | 38.07 | 36.48 |
| Dn Invert (ft): | 40.70 | 39.67 | 38.07 | 36.48 | 36.21 |
| Max Q (cfs): | 8.27 | 10.16 | 12.47 | 13.26 | 19.01 |
| Max Vel (ft/s): | 8.42 | 5.90 | 7.06 | 4.22 | 5.94 |
| Max Depth (ft): | 1.50 | 1.50 | 1.50 | 2.00 | 2.50 |




| Node ID: | MH-07 | MH-08 | MH-21 | MH-15 | MH-16 | EX-MH | Out-01 |
|---|---|---|---|---|---|---|---|
| Rim (ft): | 48.40 | 48.00 | 47.10 | 43.80 | 42.15 | 39.83 | |
| Invert (ft): | 40.85 | 40.09 | 37.52 | 36.51 | 35.71 | 34.22 | 33.23 |
| Min Pipe Cover (ft): | 5.55 | 5.91 | 4.28 | 5.29 | 3.44 | 2.92 | |
| Max HGL (ft): | 45.8300 | 45.6900 | 44.0500 | 43.8000 | 42.1500 | 39.9700 | 39.3000 |

| Link ID: | Link-36 | 58 | 56 | 55 | 54 | 53 |
|---|---|---|---|---|---|---|
| Length (ft): | 76.00 | 258.00 | 101.00 | 80.00 | 65.00 | 77.25 |
| Dia (ft): | 2.00 | 2.00 | 2.00 | 2.00 | 2.50 | 2.50 |
| Slope (ft/ft): | 0.0100 | 0.0100 | 0.0100 | 0.0100 | 0.0200 | 0.0128 |
| Up Invert (ft): | 40.85 | 40.09 | 37.52 | 36.51 | 35.71 | 34.22 |
| Dn Invert (ft): | 40.09 | 37.52 | 36.51 | 35.71 | 34.41 | 33.23 |
| Max Q (cfs): | 9.33 | 18.97 | 27.37 | 27.36 | 48.26 | 57.95 |
| Max Vel (ft/s): | 6.60 | 6.04 | 8.71 | 8.71 | 9.97 | 12.18 |
| Max Depth (ft): | 2.00 | 2.00 | 2.00 | 2.00 | 2.50 | 2.50 |




| Node ID: | OCS-01 | Jun-54 | MH-11 | MH-10 | MH-17 | MH-16 |
|---|---|---|---|---|---|---|
| Rim (ft): | 48.15 | 48.20 | 47.80 | 46.35 | 41.70 | 42.15 |
| Invert (ft): | 42.86 | 40.70 | 39.67 | 38.07 | 36.48 | 35.71 |
| Min Pipe Cover (ft): | 3.79 | 6.00 | 6.63 | 6.28 | 2.72 | 3.44 |
| Max HGL (ft): | 47.7900 | 47.2100 | 45.7600 | 46.3500 | 41.7200 | 42.1500 |

| Link ID: | Link-56 | Link-55 | Link-46 | Link-47 | Link-48 |
|---|---|---|---|---|---|
| Length (ft): | 108.00 | 104.00 | 160.00 | 159.00 | 27.00 |
| Dia (ft): | 1.50 | 1.50 | 1.50 | 2.00 | 2.50 |
| Slope (ft/ft): | 0.0200 | 0.0099 | 0.0100 | 0.0100 | 0.0100 |
| Up Invert (ft): | 42.86 | 40.70 | 39.67 | 38.07 | 36.48 |
| Dn Invert (ft): | 40.70 | 39.67 | 38.07 | 36.48 | 36.21 |
| Max Q (cfs): | 9.39 | 11.47 | 13.99 | 15.15 | 20.10 |
| Max Vel (ft/s): | 8.61 | 6.49 | 7.92 | 4.82 | 6.33 |
| Max Depth (ft): | 1.50 | 1.50 | 1.50 | 2.00 | 2.50 |

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Baywater Corbin Drive**
Project Number: **B0509**
Project Location: **Darien, CT**
Description: **Drainage Area Comparison**
Prepared By: **PAR** Date: **August 30, 2018**

| | | | | |
|---|---|---|---|---|
| Total Area Draining to Discharge Pont in Goodwives | | = | 1.777 | sq mi |
| Onsite Area Draining to Discharge Pont in Goodwives | | = | 0.008125 | sq mi |
| Area Ratio | (Total Area/Onsite Area) | = | 218.7 | |

Use Joint Probability Analysis Table (Next Sheet)

| Ratio | 100 to 1 |
|---|---|

**Table 8-3 Joint Probability Analysis**

| AREA RATIO | FREQUENCIES FOR COINCIDENTAL OCCURRENCE | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 10-Year Design | | 25-Year Design | | 50-Year Design | | 100-Year Design | |
| | Main Stream | Tributary | Main Stream | Tributary | Main Stream | Tributary | Main Stream | Tributary |
| 10,000 TO 1 | 2 | 10 | 2 | 25 | 2 | 50 | 2 | 100 |
| | 10 | 2 | 25 | 2 | 50 | 2 | 100 | 2 |
| 1,000 TO 1 | 2 | 10 | 2 | 25 | 5 | 50 | 10 | 100 |
| | 10 | 2 | 25 | 2 | 50 | 5 | 100 | 10 |
| 100 TO 1 | 5 | 10 | 5 | 25 | 10 | 50 | 25 | 100 |
| | 10 | 5 | 25 | 5 | 50 | 10 | 100 | 25 |
| 10 TO 1 | 10 | 10 | 10 | 25 | 25 | 50 | 50 | 100 |
| | 10 | 10 | 25 | 10 | 50 | 25 | 100 | 50 |
| 1 TO 1 | 10 | 10 | 25 | 25 | 50 | 50 | 100 | 100 |
| | 10 | 10 | 25 | 25 | 50 | 50 | 100 | 100 |

Notes: Shaded values denote design combination for coincidental frequency occurrence.
Non-shaded values denote check combination for coincidental frequency occurrence.

### 8.3.7 Minimum Culvert Size

Culverts providing for passage of storm runoff from one side of the highway to the other shall not be smaller than 600mm (24 in) for interstate systems and 450mm (18 in) for other systems.

### 8.3.8 Maximum Velocity

The maximum velocity at the culvert outlet shall be consistent with the velocity in the natural channel or shall be mitigated with outlet protection measures, energy dissipation and if required, channel stabilization. (See Section 8.7 and Chapter 7.)

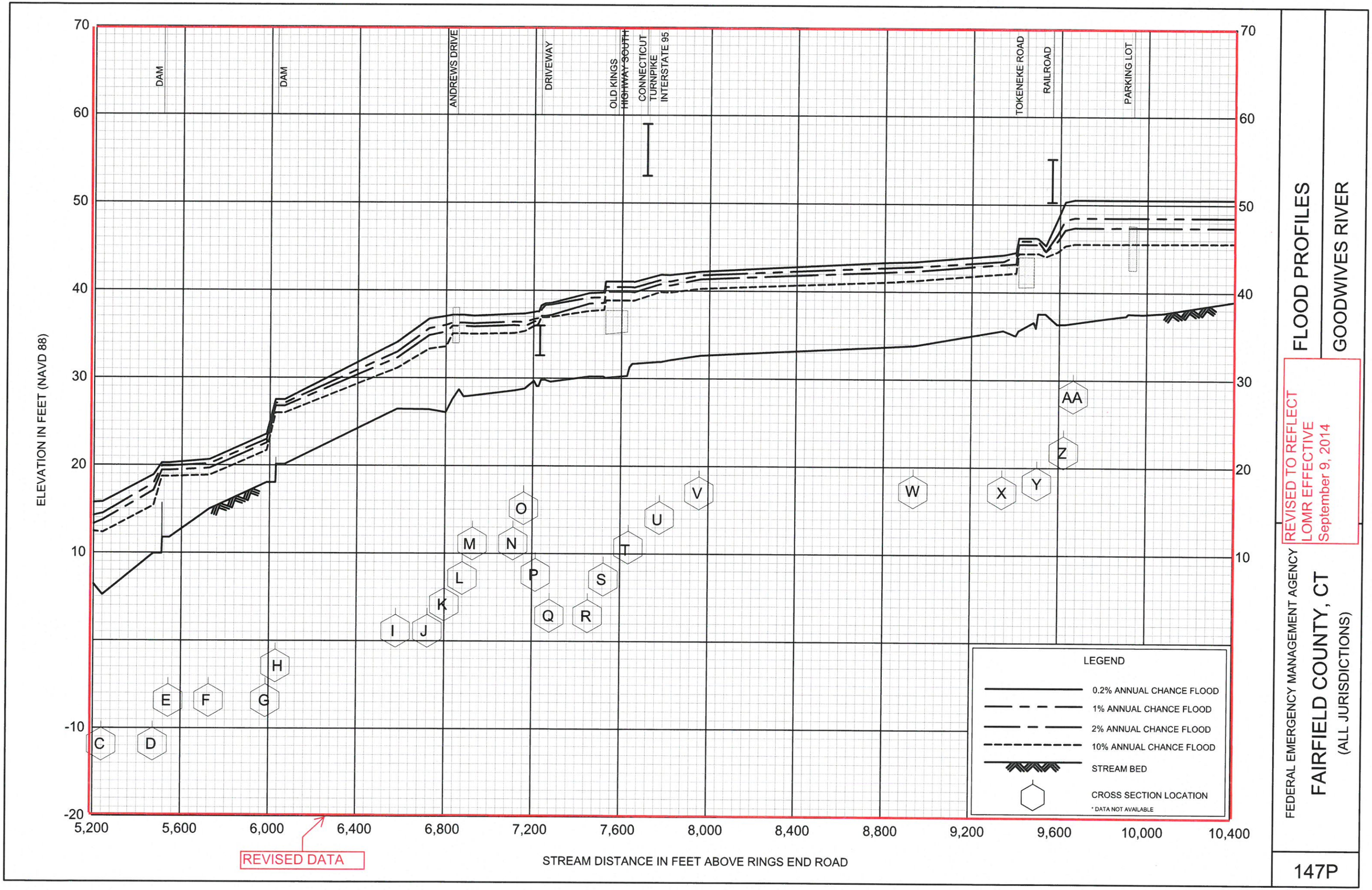
### 8.3.9 Minimum Velocity

The minimum velocity in the culvert barrel shall result in a tractive force ($\tau=\gamma dS$) greater than critical $\tau$ of the transported streambed material at low flow rates, unless material is required to aid in fish passage. See Section 7.6.6 for a detailed discussion on tractive force.

### 8.3.10 Storage - Temporary or Permanent

If storage is being assumed upstream of the culvert, consideration shall be given to:

- limiting the total area of flooding
- limiting the average time that bankfull stage is exceeded for the design flood to 48 hr in rural areas or 6 hr in urban areas
- ensuring that the storage area will remain available for the life of the culvert through the purchase of right-of-way or easement




# FLOOD PROFILES

## GOODWIVES RIVER

REVISED TO REFLECT
LOMR EFFECTIVE
September 9, 2014

FEDERAL EMERGENCY MANAGEMENT AGENCY

## FAIRFIELD COUNTY, CT

(ALL JURISDICTIONS)

147P

Tighe&Bond

# ATTACHMENT B

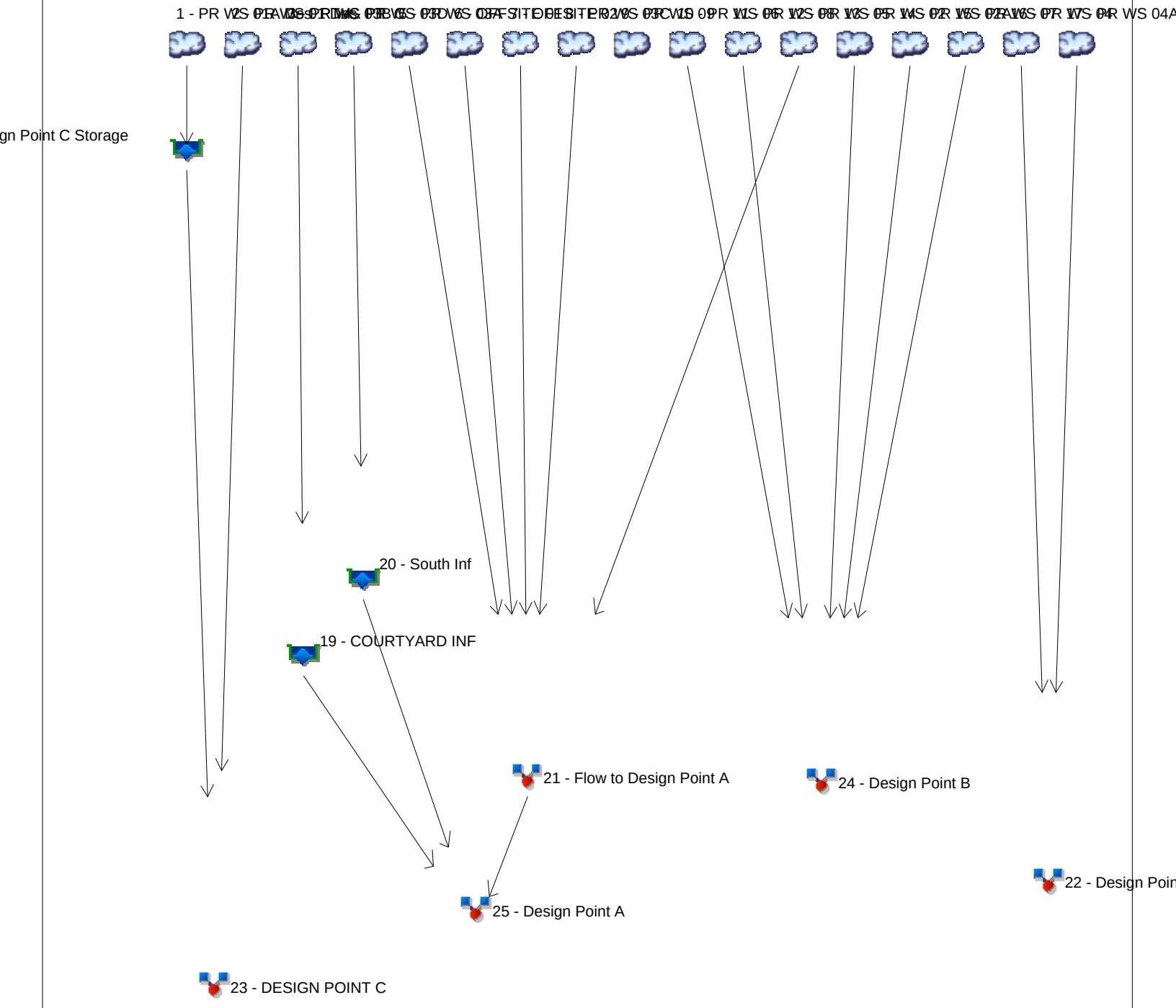
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Baywater Corbin Drive**
Project Number: **B0509**
Project Location: **Darien, CT**
Description: **Comparitive Hydrology**
Prepared By: **PAR** Date: **August 30, 2018**

| | 2 YR | 10 YR | 25 YR | 50 YR |
|---|---|---|---|---|
| **Design Point A** | | | | |
| $Q_{pk}$ - Existing | 19.83 | 32.52 | 40.51 | 46.73 |
| $Q_{pk}$ - Proposed | 10.98 | 31.81 | 40.28 | 46.65 |
| Reduction in Peak Flow | **44.63%** | **2.18%** | **0.57%** | **0.17%** |
| **Design Point B** | | | | |
| $Q_{pk}$ - Existing | 47.69 | 61.54 | 65.19 | 65.02 |
| $Q_{pk}$ - Proposed | 47.62 | 61.1 | 64.13 | 64.73 |
| Reduction in Peak Flow | **0.15%** | **0.71%** | **1.63%** | **0.45%** |
| **Design Point C** | | | | |
| $Q_{pk}$ - Existing | 1.066 | 1.943 | 2.494 | 2.924 |
| $Q_{pk}$ - Proposed | 1.064 | 1.901 | 2.409 | 2.818 |
| Reduction in Peak Flow | **0.19%** | **2.16%** | **3.41%** | **3.63%** |
| **Design Point D** | | | | |
| $Q_{pk}$ - Existing | 1.813 | 2.958 | 3.675 | 4.23 |
| $Q_{pk}$ - Proposed | 1.386 | 2.343 | 2.953 | 3.428 |
| Reduction in Peak Flow | **23.55%** | **20.79%** | **19.65%** | **18.96%** |
| **Design Point E** | | | | |
| $Q_{pk}$ - Existing | 0.926 | 1.437 | 1.753 | 1.997 |
| $Q_{pk}$ - Proposed | 0.706 | 1.08 | 1.312 | 1.492 |
| Reduction in Peak Flow | **23.76%** | **24.84%** | **25.16%** | **25.29%** |

# Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SCS Runoff | 0.639 | 2 | 724 | 2,167 | ------ | ------ | ------ | PR WS 01A Des. PT. C |
| 2 | SCS Runoff | 0.792 | 2 | 738 | 3,913 | ------ | ------ | ------ | PR WS 01 Des. PT. C |
| 3 | SCS Runoff | 3.766 | 2 | 724 | 12,764 | ------ | ------ | ------ | PR WS 03B |
| 4 | SCS Runoff | 8.751 | 2 | 724 | 29,659 | ------ | ------ | ------ | PR WS 03D |
| 5 | SCS Runoff | 1.318 | 2 | 736 | 6,273 | ------ | ------ | ------ | PR WS 03A |
| 6 | SCS Runoff | 3.714 | 2 | 750 | 23,776 | ------ | ------ | ------ | OFFSITE 01 |
| 7 | SCS Runoff | 0.425 | 2 | 726 | 1,471 | ------ | ------ | ------ | OFFSITE 02 |
| 8 | SCS Runoff | 4.680 | 2 | 724 | 15,516 | ------ | ------ | ------ | PR WS 03C |
| 9 | SCS Runoff | 0.706 | 2 | 724 | 2,393 | ------ | ------ | ------ | PR WS 09 |
| 10 | SCS Runoff | 3.656 | 2 | 724 | 12,392 | ------ | ------ | ------ | PR WS 06 |
| 11 | SCS Runoff | 0.256 | 2 | 724 | 784 | ------ | ------ | ------ | PR WS 08 |
| 12 | SCS Runoff | 1.615 | 2 | 724 | 5,474 | ------ | ------ | ------ | PR WS 05 |
| 13 | SCS Runoff | 1.389 | 2 | 724 | 4,706 | ------ | ------ | ------ | PR WS 02 |
| 14 | SCS Runoff | 0.546 | 2 | 724 | 1,851 | ------ | ------ | ------ | PR WS 02A |
| 15 | SCS Runoff | 1.335 | 2 | 724 | 4,526 | ------ | ------ | ------ | PR WS 07 |
| 16 | SCS Runoff | 0.824 | 2 | 740 | 4,324 | ------ | ------ | ------ | PR WS 04 |
| 17 | SCS Runoff | 0.966 | 2 | 724 | 3,273 | ------ | ------ | ------ | PR WS 04A |
| 18 | Reservoir | 0.361 | 2 | 730 | 352 | 1 | 47.20 | 729 | Design Point C Storage |
| 19 | Reservoir | 1.342 | 2 | 734 | 1,786 | 3 | 45.59 | 4,721 | COURTYARD INF |
| 20 | Reservoir | 3.011 | 2 | 734 | 4,884 | 4 | 43.83 | 10,375 | South Inf |
| 21 | Combine | 8.817 | 2 | 724 | 52,510 | 5, 6, 7, 8, 12, | ------ | ------ | Flow to Design Point A |
| 22 | Combine | 1.386 | 2 | 724 | 7,597 | 16, 17, | ------ | ------ | Design Point D |
| 23 | Combine | 1.004 | 2 | 730 | 4,264 | 2, 18, | ------ | ------ | DESIGN POINT C |
| 24 | Combine | 7.182 | 2 | 724 | 24,259 | 10, 11, 13, 14, 15, | ------ | ------ | Design Point B |
| 25 | Combine | 10.98 | 2 | 734 | 59,180 | 19, 20, 21, | ------ | ------ | Design Point A |

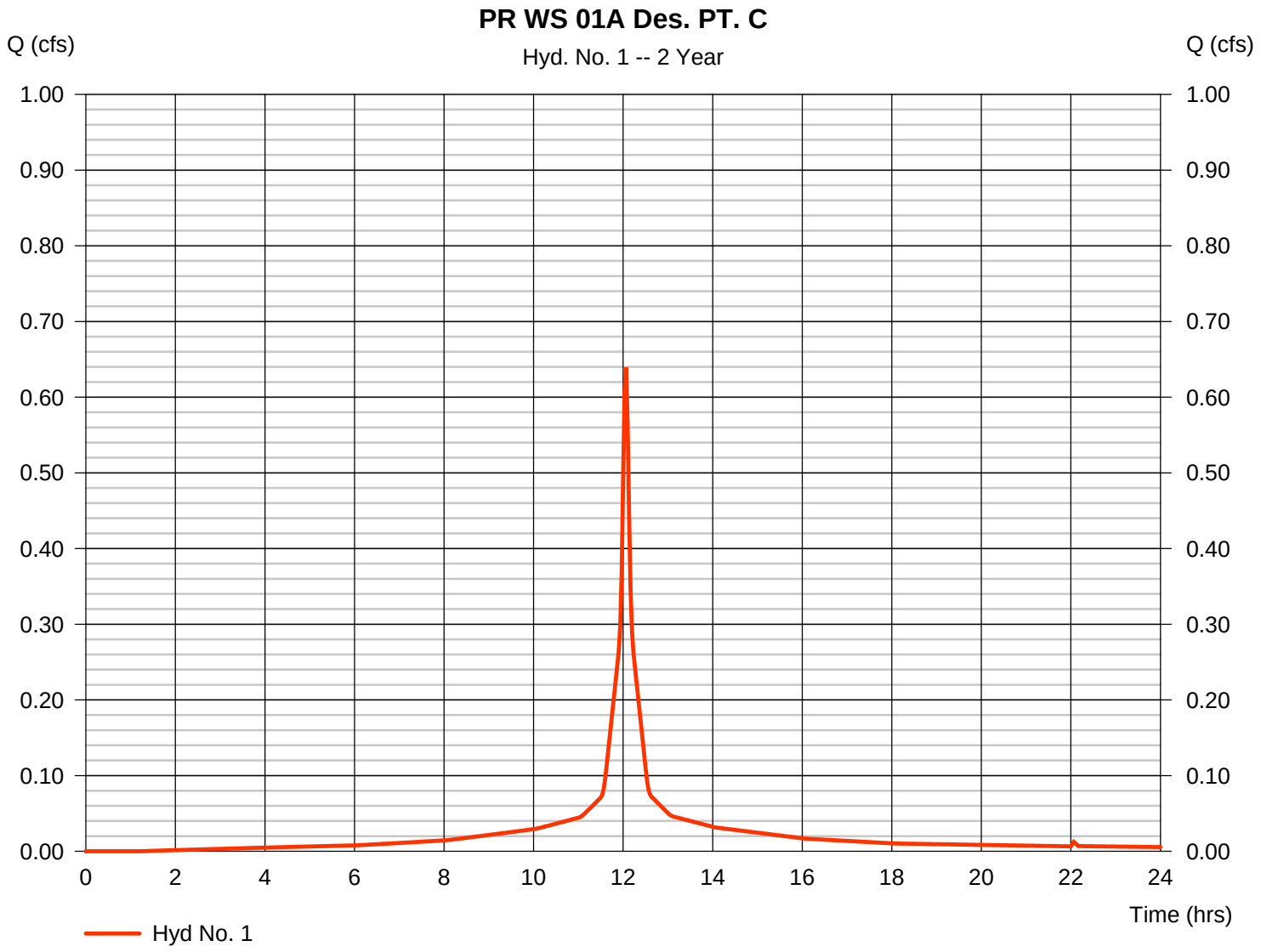
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 1

PR WS 01A Des. PT. C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.639 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 2,167 cuft |
| Drainage area | = 0.192 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



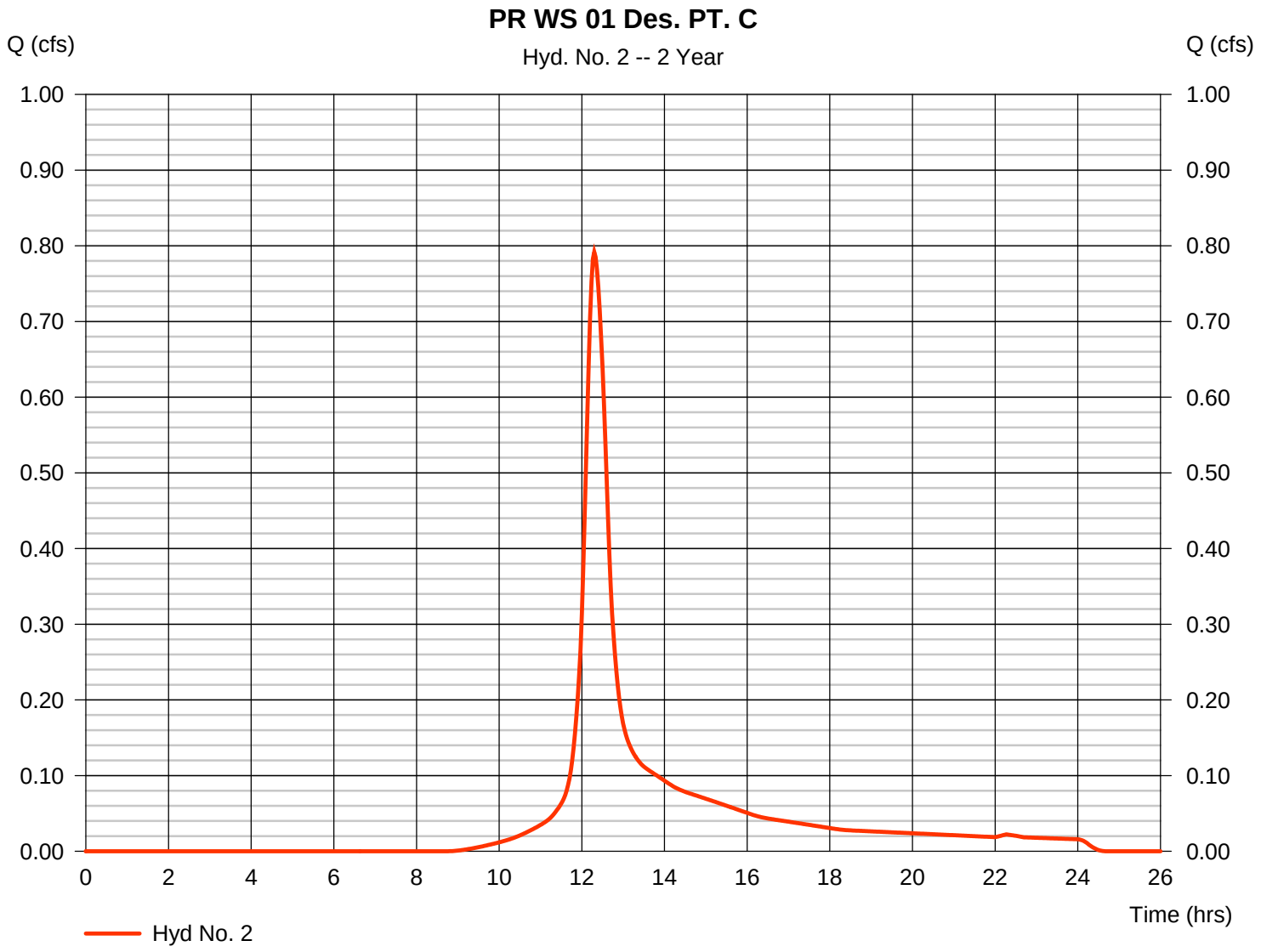
# Hydrograph Report



## Hyd. No. 2

PR WS 01 Des. PT. C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.792 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.30 hrs |
| Time interval | = 2 min | Hyd. volume | = 3,913 cuft |
| Drainage area | = 0.626 ac | Curve number | = 81 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 25.80 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



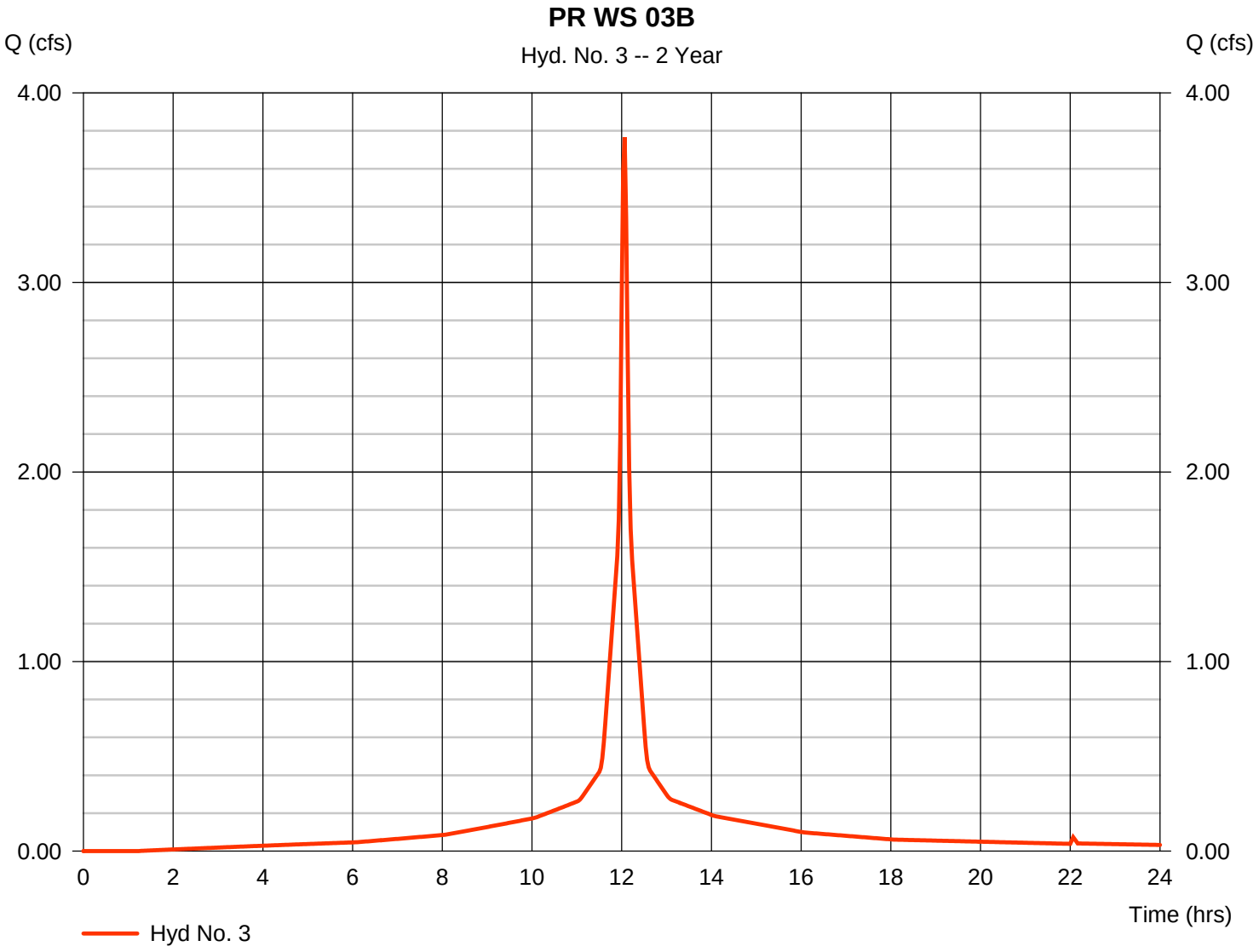
# Hydrograph Report



## Hyd. No. 3

PR WS 03B

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 3.766 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 12,764 cuft |
| Drainage area | = | 1.131 ac | Curve number | = | 98 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 3.55 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



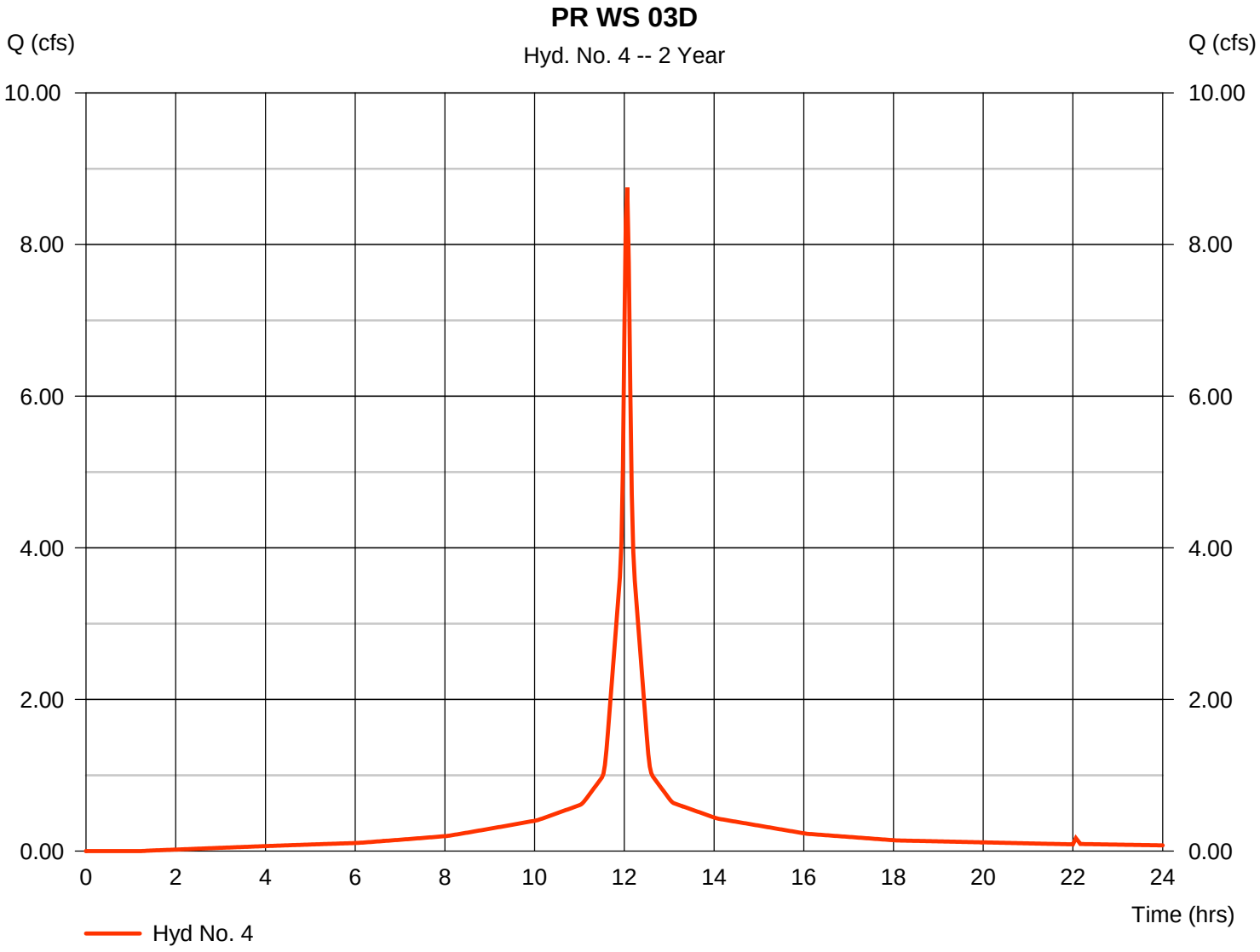
# Hydrograph Report



## Hyd. No. 4

PR WS 03D

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 8.751 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 29,659 cuft |
| Drainage area | = | 2.628 ac | Curve number | = | 98 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 3.55 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



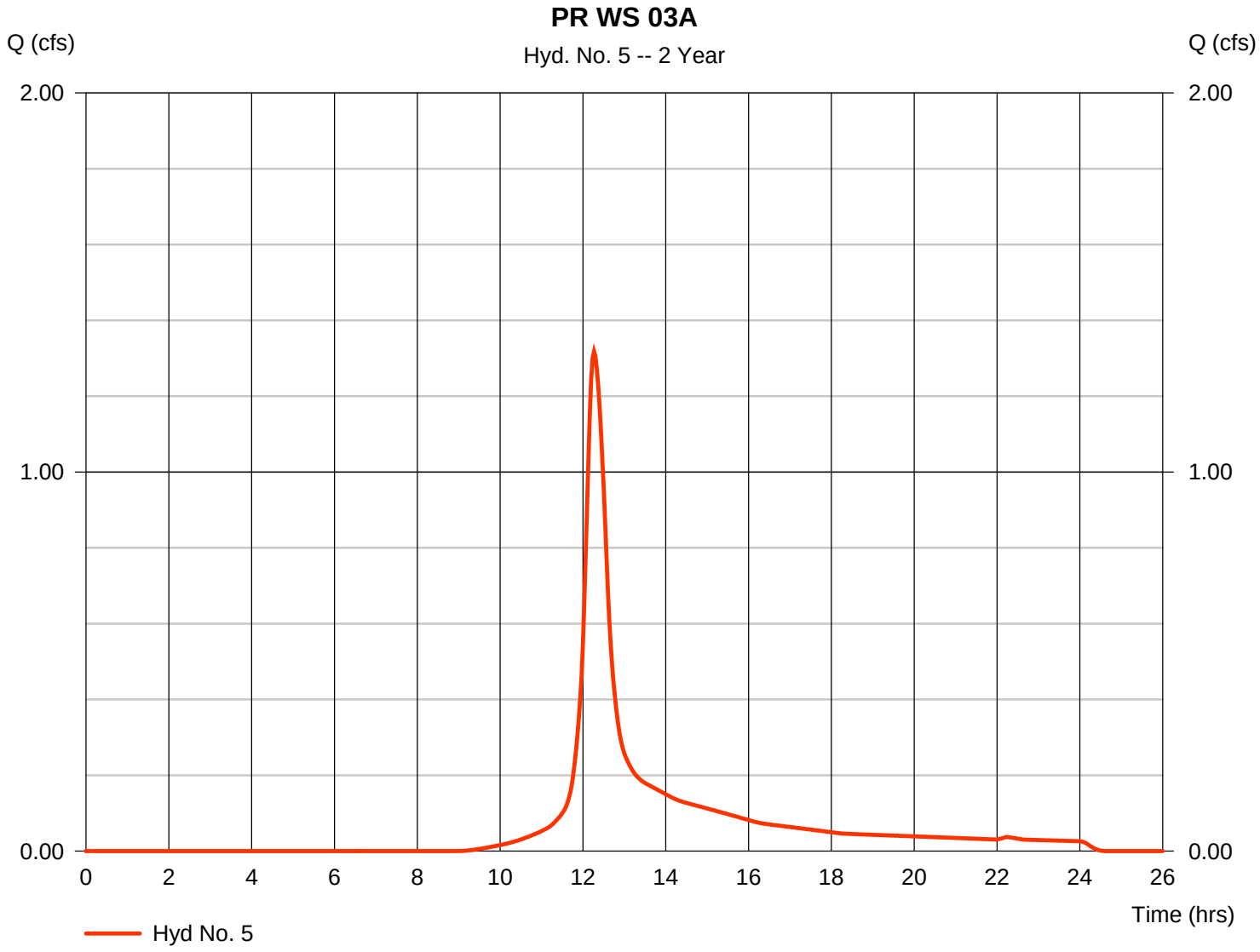
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 5

PR WS 03A

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 1.318 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 12.27 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 6,273 cuft |
| Drainage area | = | 1.013 ac | Curve number | = | 80 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 20.70 min |
| Total precip. | = | 3.55 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



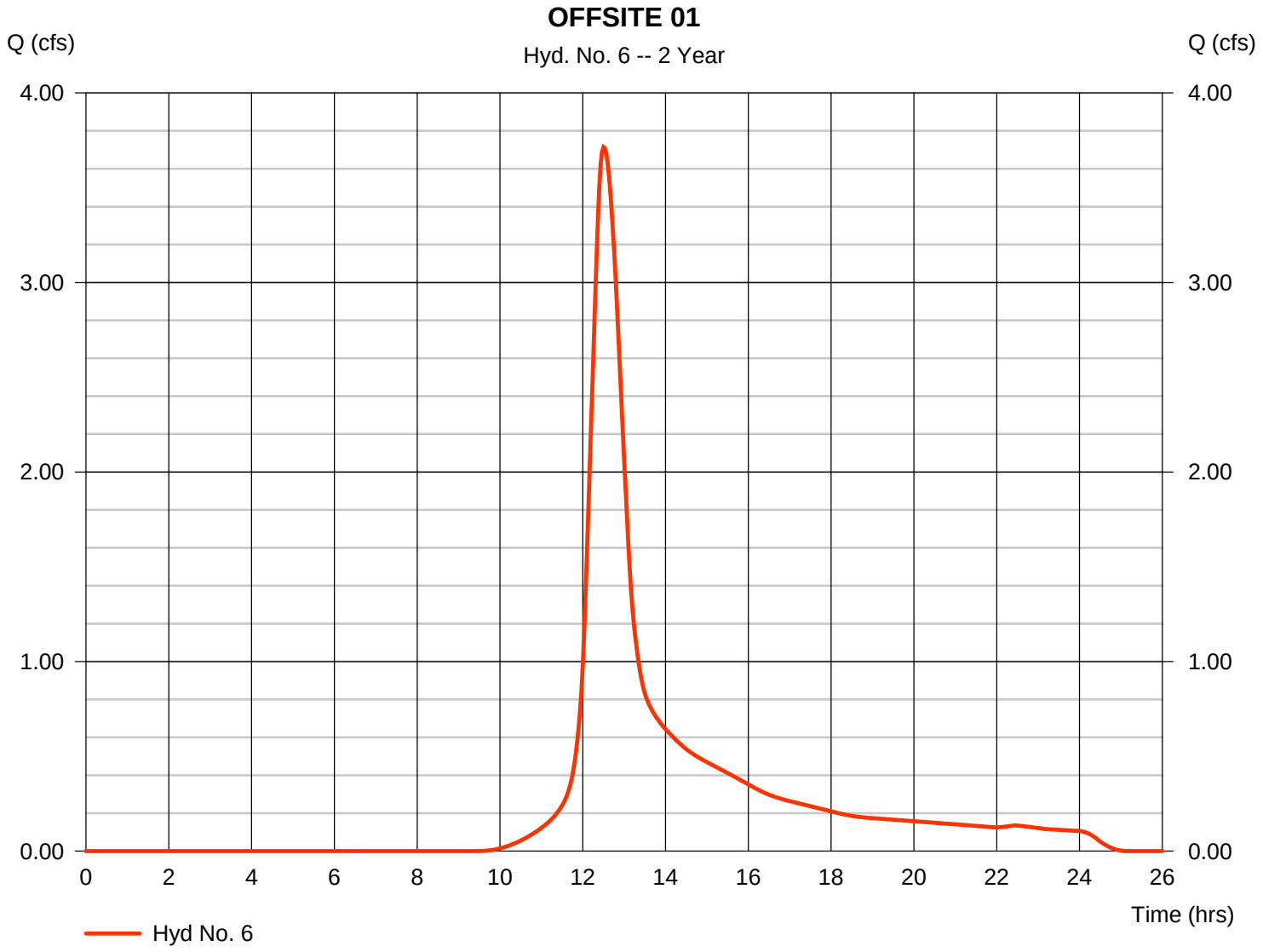
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 6

OFFSITE 01

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 3.714 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.50 hrs |
| Time interval | = 2 min | Hyd. volume | = 23,776 cuft |
| Drainage area | = 4.225 ac | Curve number | = 78 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 41.40 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



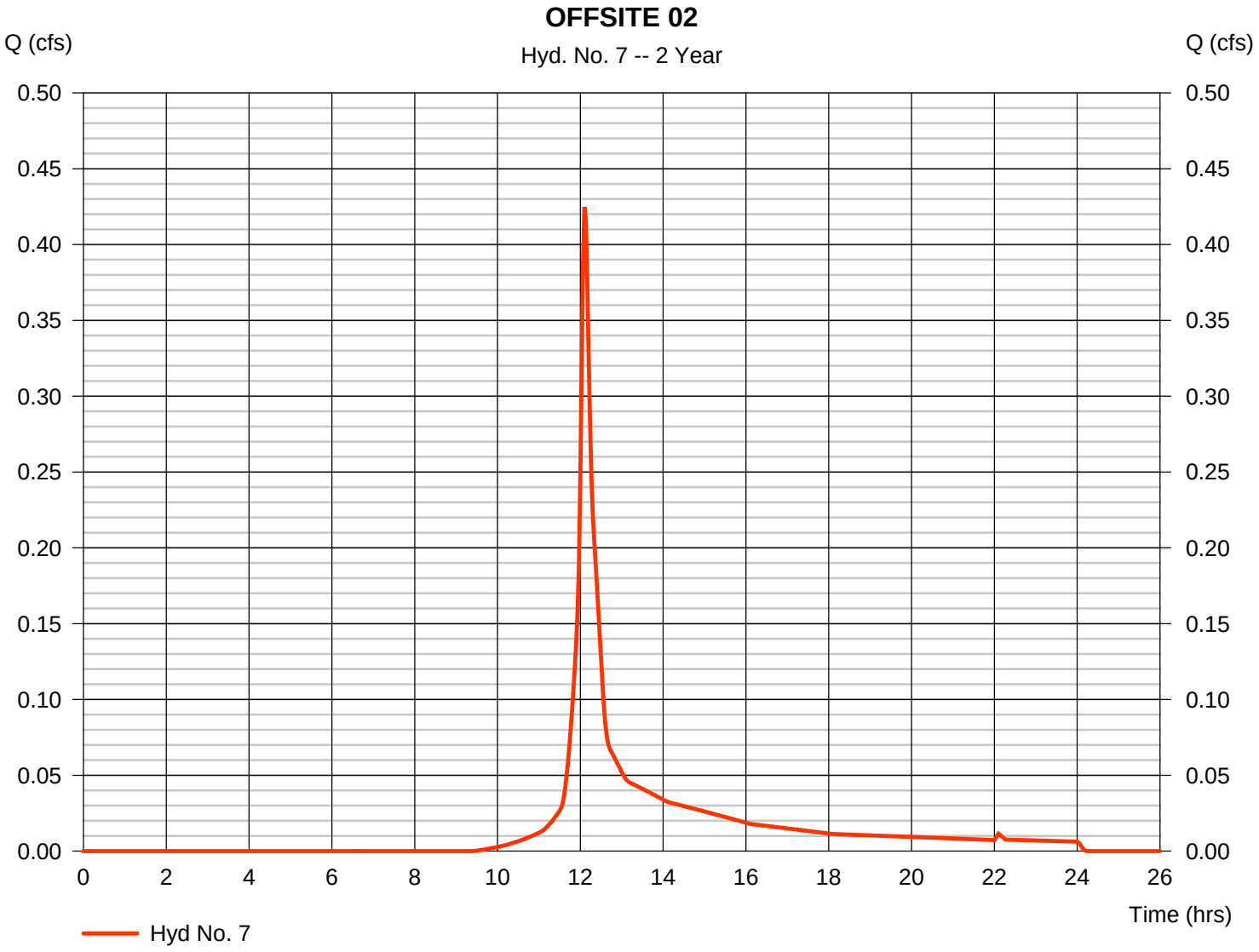
# Hydrograph Report



## Hyd. No. 7

OFFSITE 02

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 0.425 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 12.10 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 1,471 cuft |
| Drainage area | = | 0.264 ac | Curve number | = | 78 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 7.10 min |
| Total precip. | = | 3.55 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



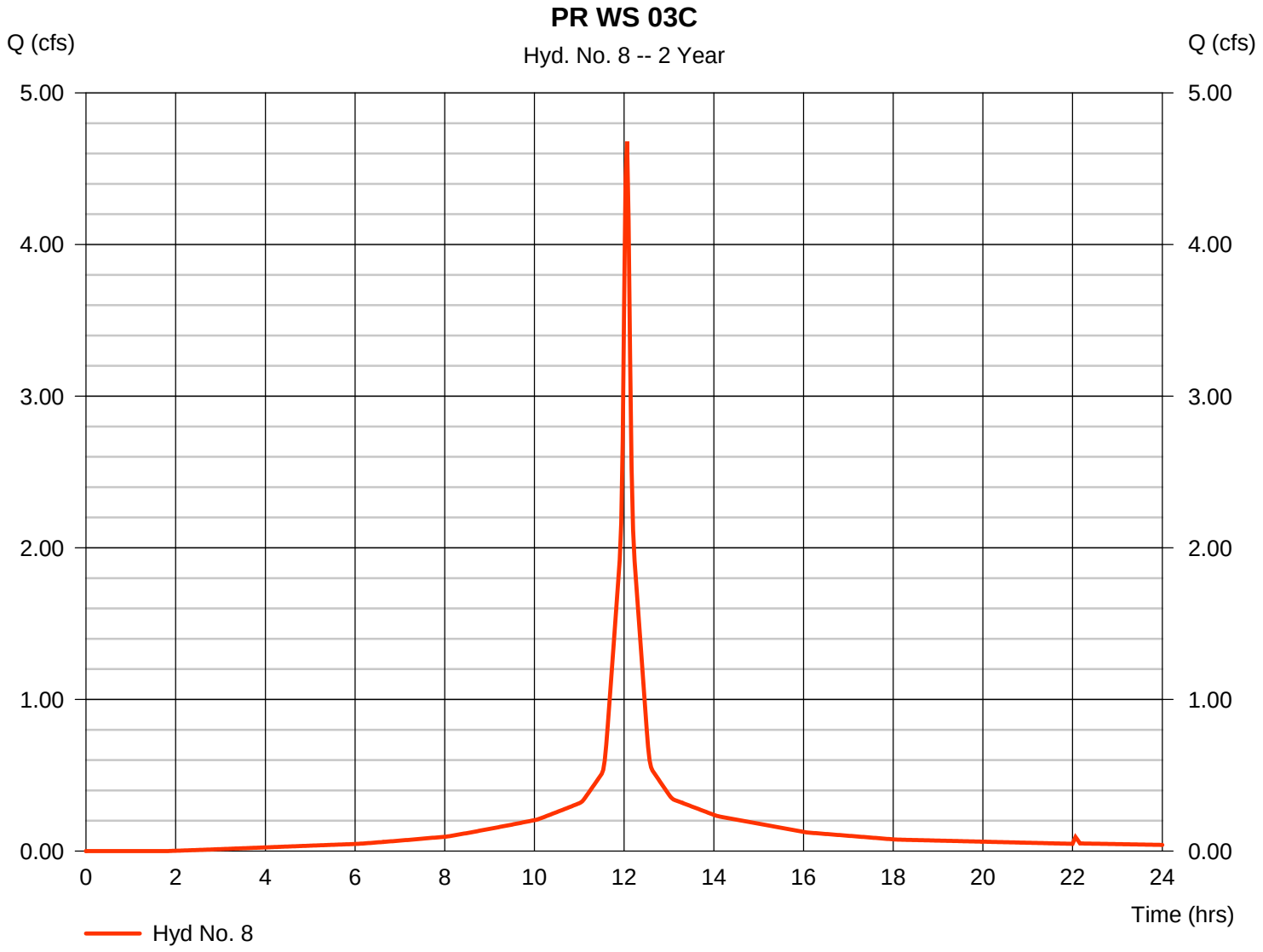
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 8

PR WS 03C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 4.680 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 15,516 cuft |
| Drainage area | = 1.423 ac | Curve number | = 97 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



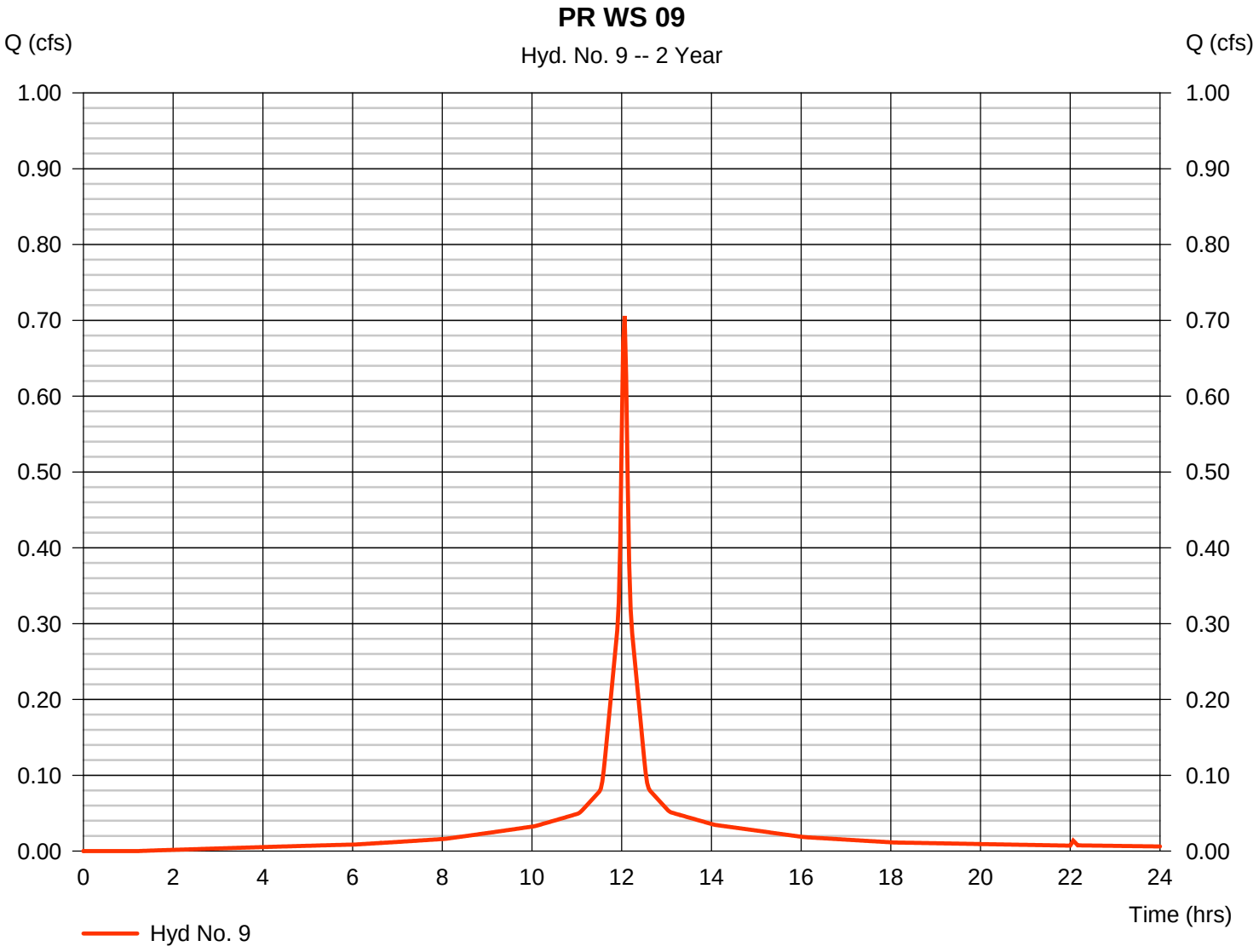
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 9

PR WS 09

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.706 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 2,393 cuft |
| Drainage area | = 0.212 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



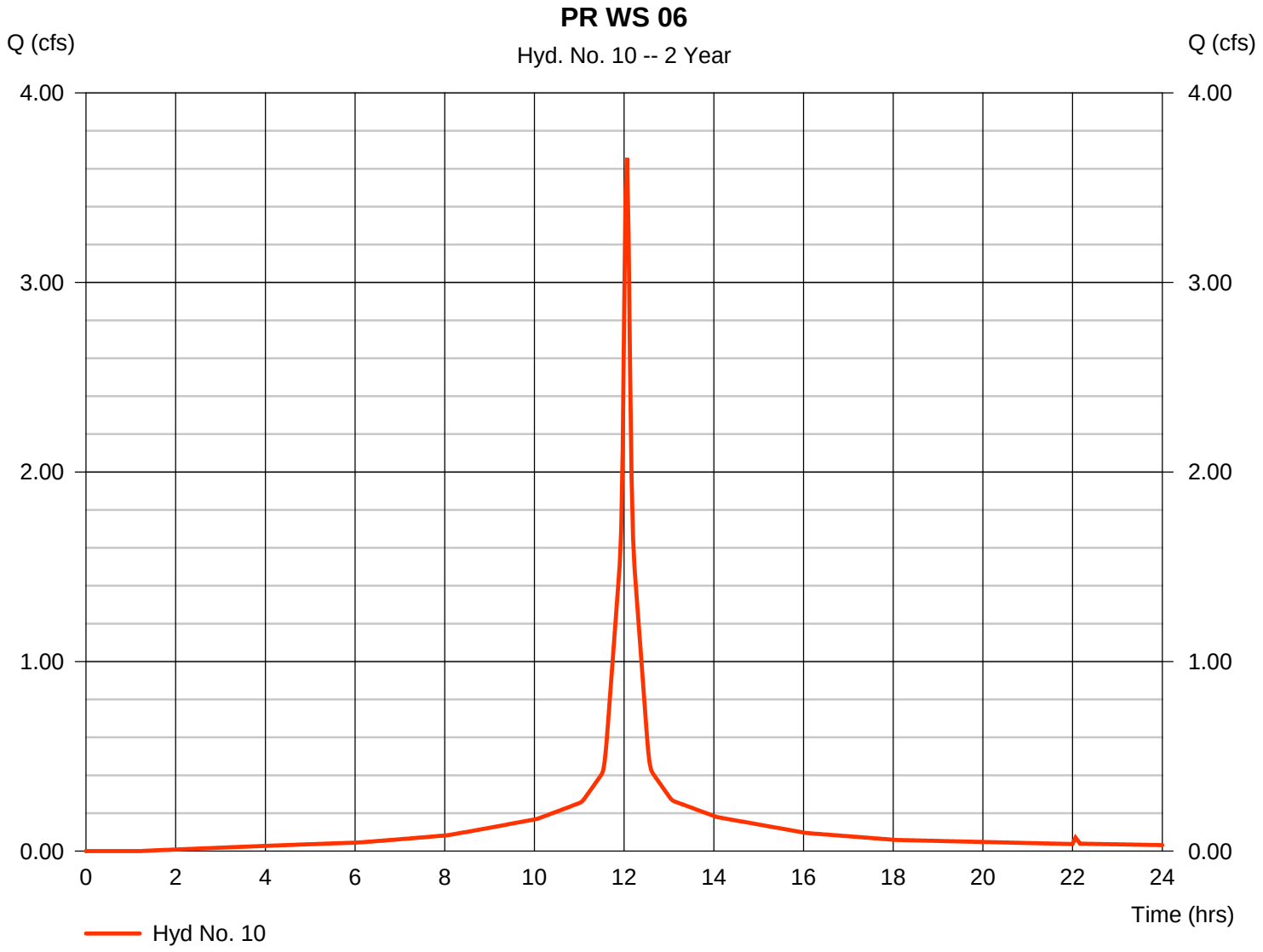
# Hydrograph Report



## Hyd. No. 10

PR WS 06

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 3.656 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 12,392 cuft |
| Drainage area | = | 1.098 ac | Curve number | = | 98 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 3.55 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



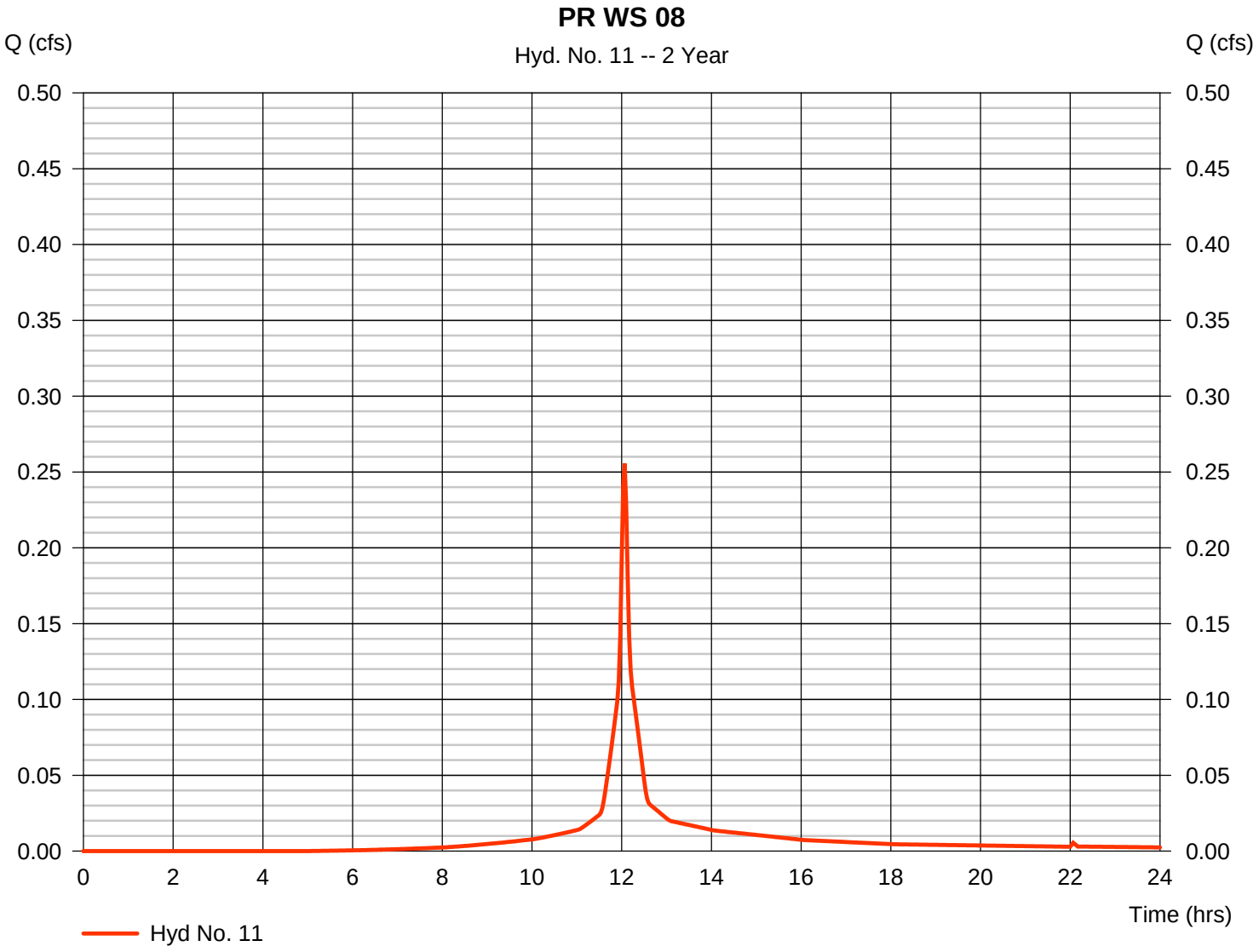
# Hydrograph Report



## Hyd. No. 11

PR WS 08

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.256 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 784 cuft |
| Drainage area | = 0.089 ac | Curve number | = 91 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



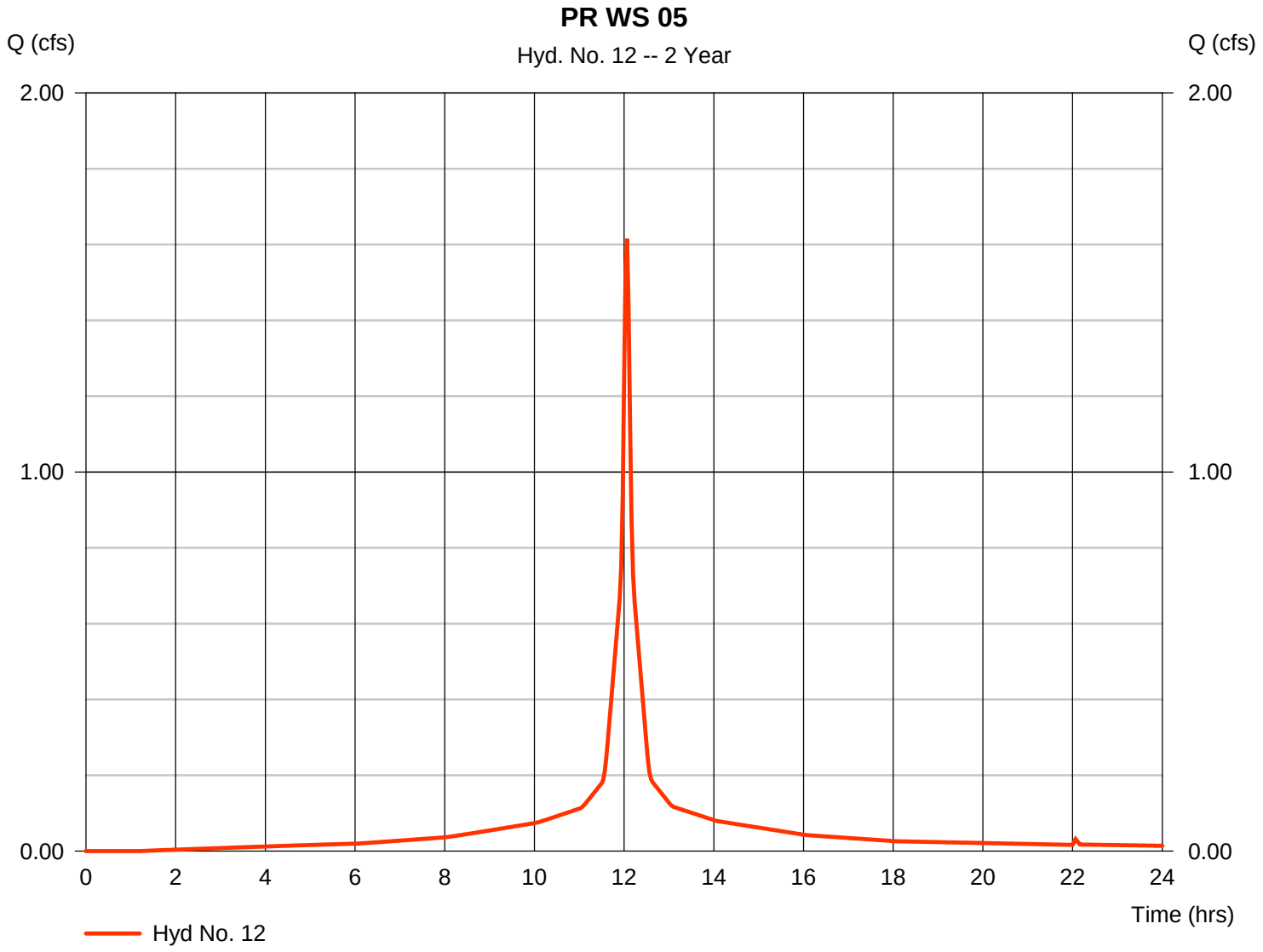
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 12

PR WS 05

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.615 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 5,474 cuft |
| Drainage area | = 0.485 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



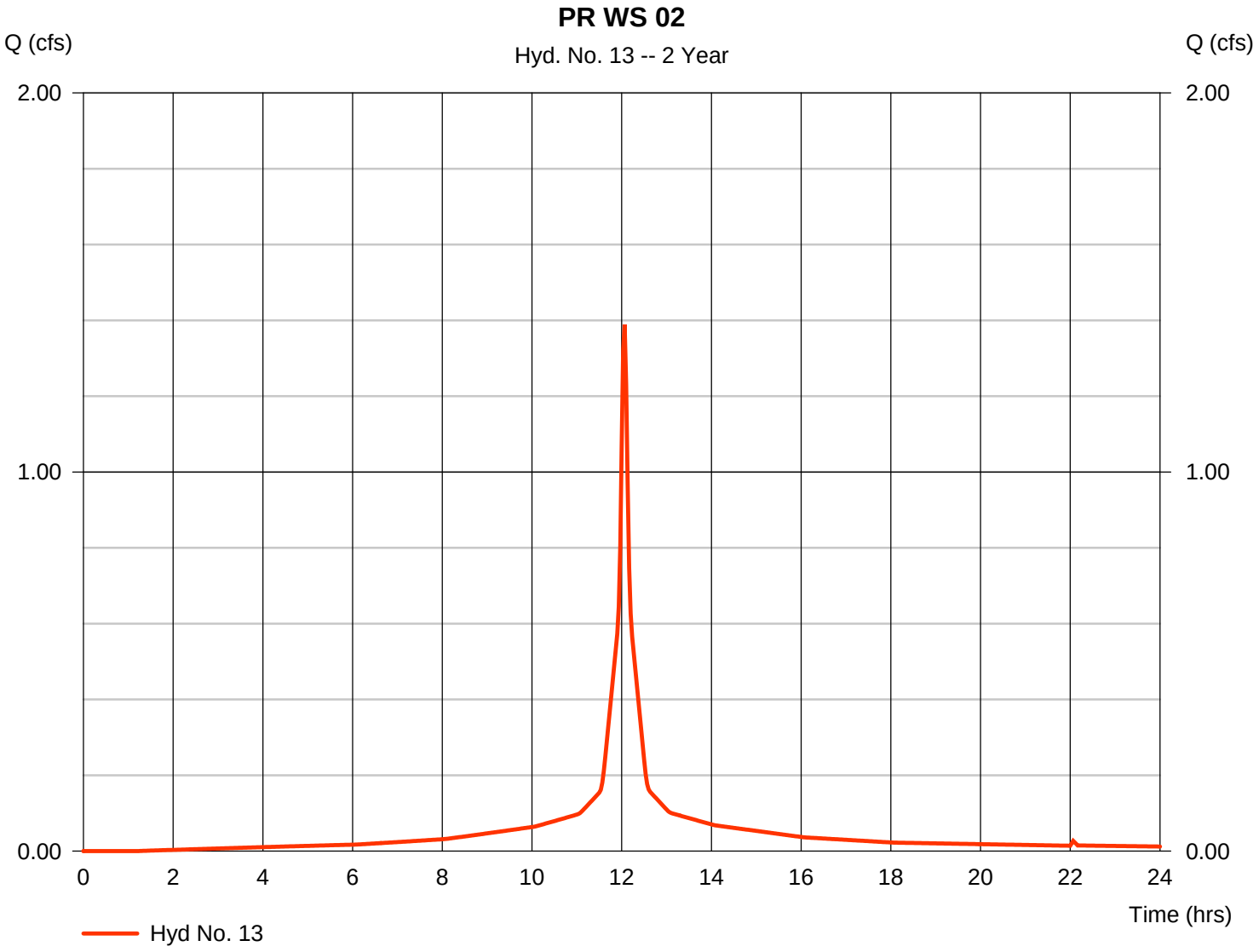
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 13

PR WS 02

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.389 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 4,706 cuft |
| Drainage area | = 0.417 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



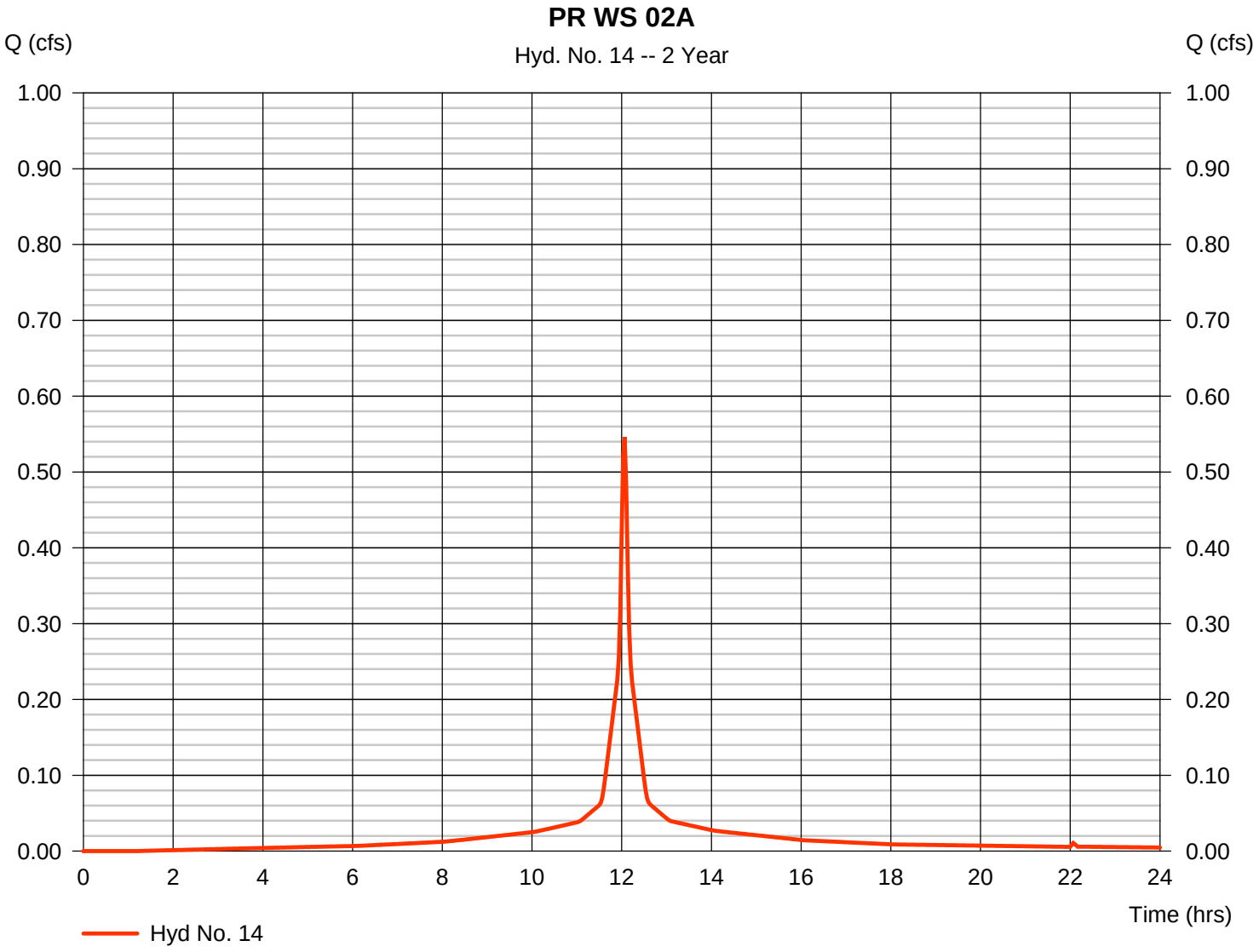
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 14

PR WS 02A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.546 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 1,851 cuft |
| Drainage area | = 0.164 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



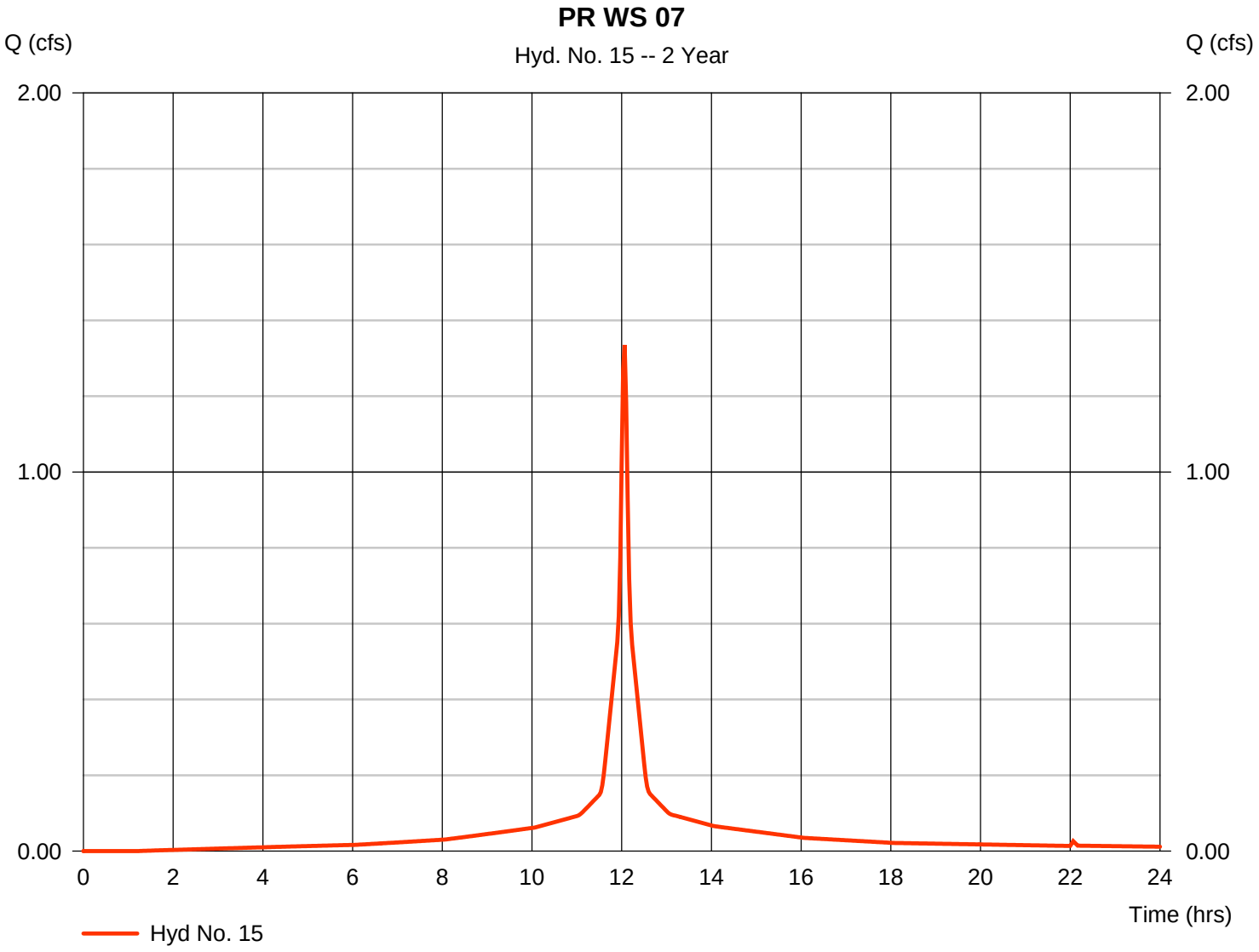
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 15

PR WS 07

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.335 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 4,526 cuft |
| Drainage area | = 0.401 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



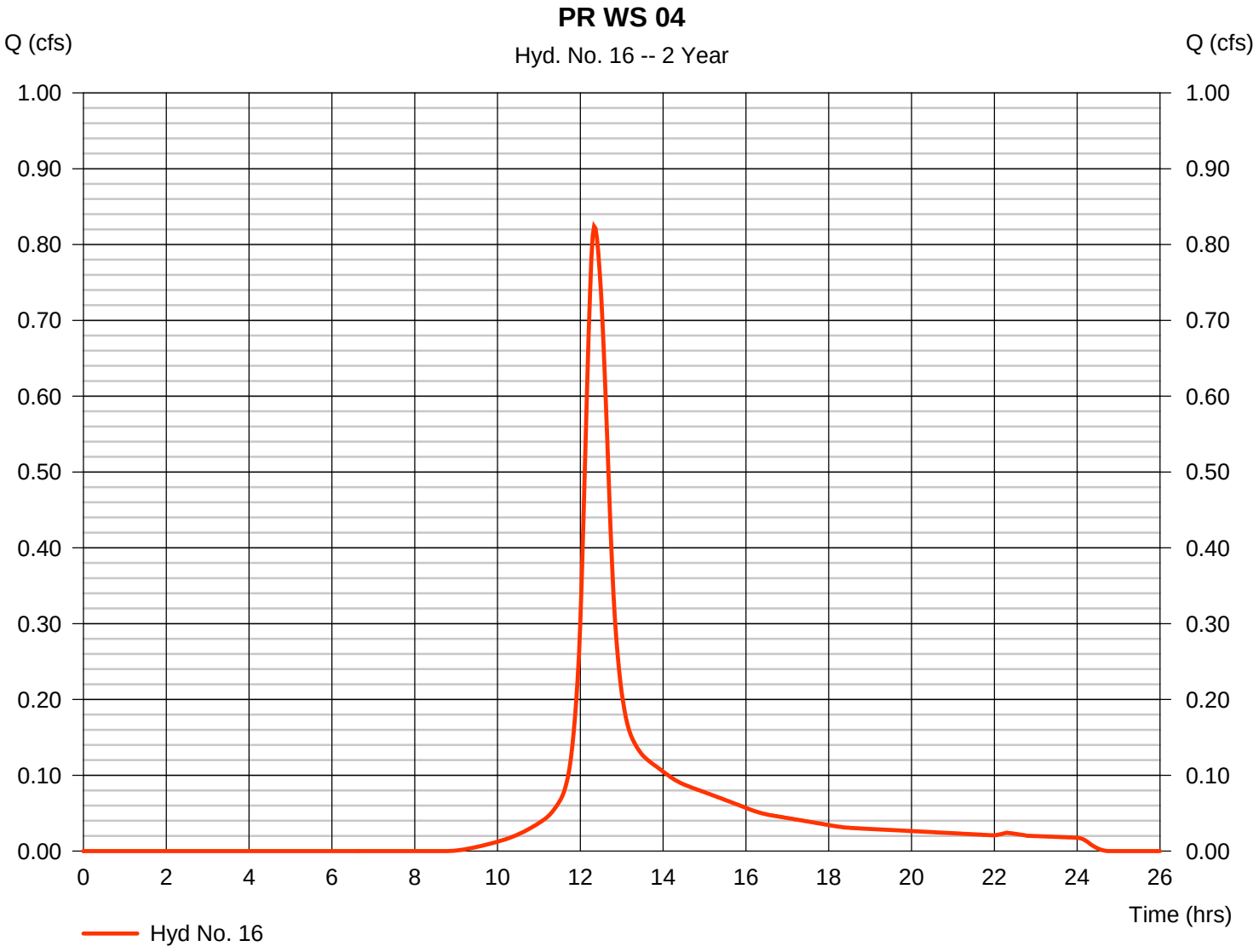
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 16

PR WS 04

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.824 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.33 hrs |
| Time interval | = 2 min | Hyd. volume | = 4,324 cuft |
| Drainage area | = 0.681 ac | Curve number | = 81 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 29.80 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



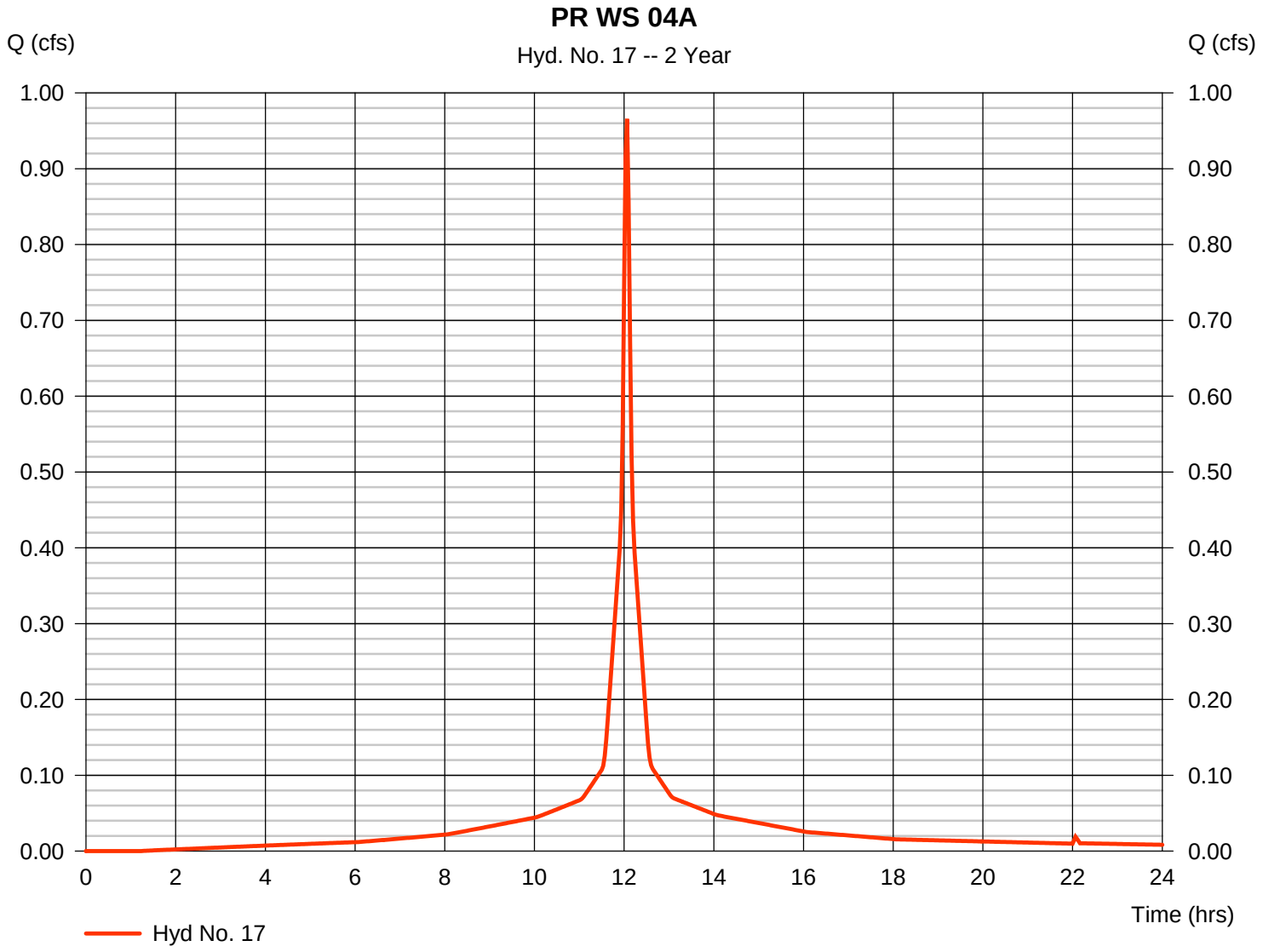
# Hydrograph Report



## Hyd. No. 17

PR WS 04A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.966 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 3,273 cuft |
| Drainage area | = 0.290 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



# Hydrograph Report

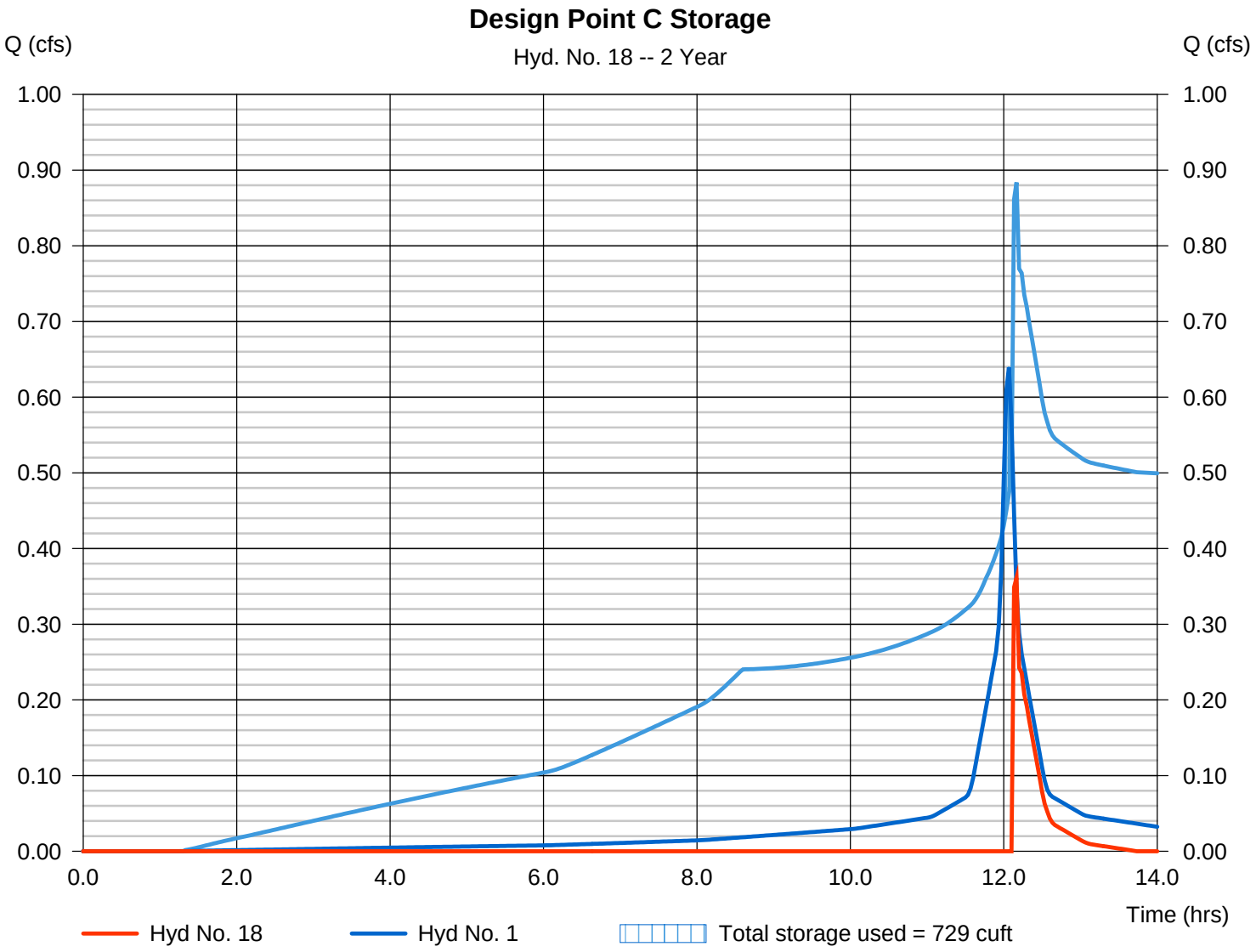
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 18

Design Point C Storage

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 0.361 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 12.17 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 352 cuft |
| Inflow hyd. No. | = | 1 - PR WS 01A Des. PT. C | Max. Elevation | = | 47.20 ft |
| Reservoir name | = | DESIGN POINT C STORAGE | Max. Storage | = | 729 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Pond No. 3 - DESIGN POINT C STORAGE

### Pond Data

**UG Chambers -**Invert elev. = 44.80 ft, Rise x Span = 2.00 x 2.00 ft, Barrel Len = 100.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
**Encasement -**Invert elev. = 43.80 ft, Width = 4.00 ft, Height = 3.50 ft, Voids = 40.00%

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 43.80 | n/a | 0 | 0 |
| 0.35 | 44.15 | n/a | 56 | 56 |
| 0.70 | 44.50 | n/a | 56 | 112 |
| 1.05 | 44.85 | n/a | 57 | 169 |
| 1.40 | 45.20 | n/a | 82 | 251 |
| 1.75 | 45.55 | n/a | 94 | 345 |
| 2.10 | 45.90 | n/a | 98 | 442 |
| 2.45 | 46.25 | n/a | 96 | 539 |
| 2.80 | 46.60 | n/a | 88 | 627 |
| 3.15 | 46.95 | n/a | 66 | 693 |
| 3.50 | 47.30 | n/a | 56 | 749 |

### Culvert / Orifice Structures

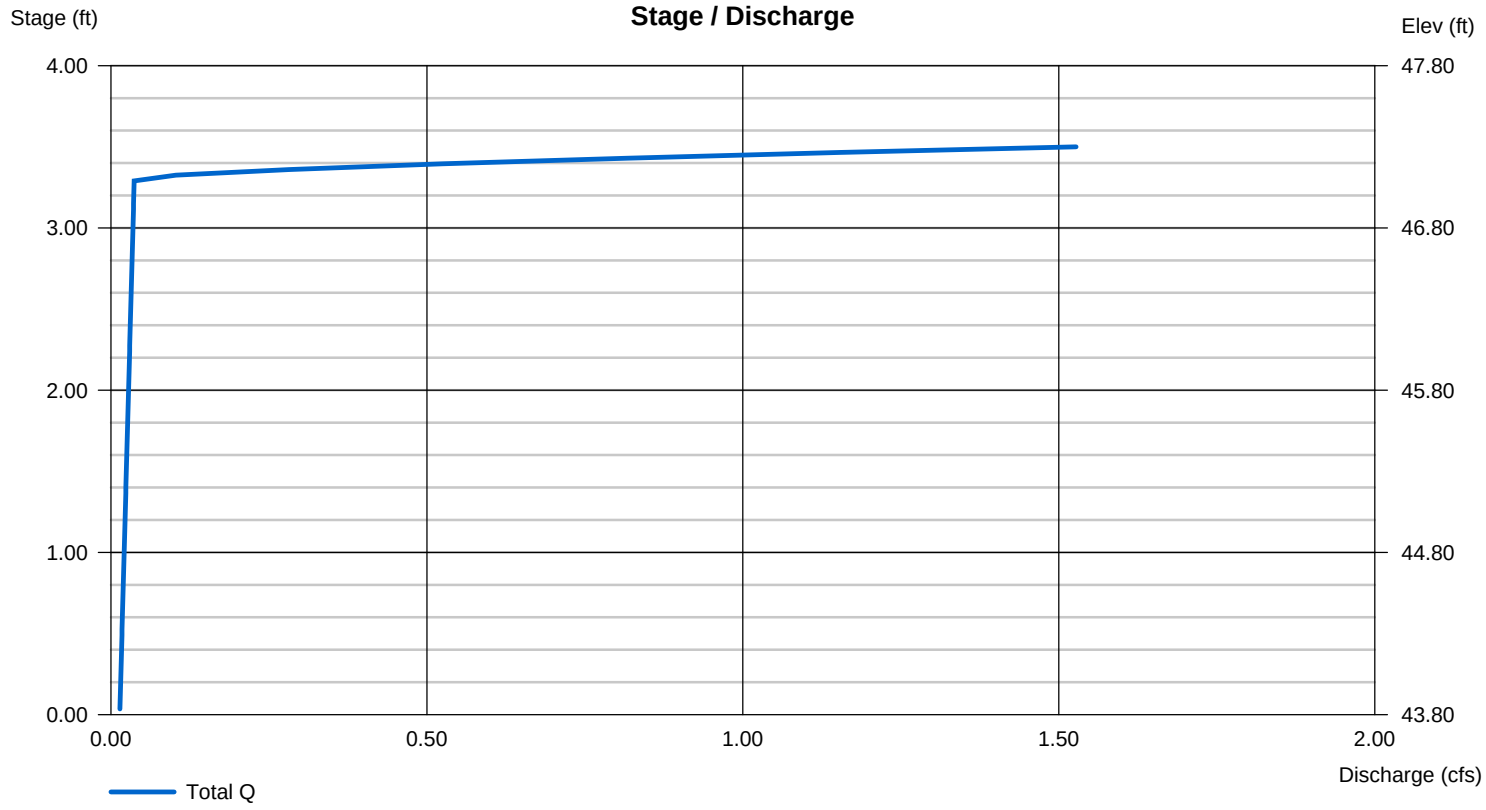
| | [A] | [B] | [C] | [PrfRsr] |
|---|---|---|---|---|
| **Rise (in)** | = 12.00 | Inactive | 0.00 | 0.00 |
| **Span (in)** | = 12.00 | 3.80 | 0.00 | 0.00 |
| **No. Barrels** | = 1 | 1 | 0 | 0 |
| **Invert El. (ft)** | = 44.80 | 46.30 | 0.00 | 0.00 |
| **Length (ft)** | = 47.00 | 0.00 | 0.00 | 0.00 |
| **Slope (%)** | = 2.83 | 0.00 | 0.00 | n/a |
| **N-Value** | = .013 | .013 | .013 | n/a |
| **Orifice Coeff.** | = 0.80 | 0.80 | 0.60 | 0.60 |
| **Multi-Stage** | = n/a | Yes | No | No |

### Weir Structures

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| **Crest Len (ft)** | = 5.00 | 0.00 | 0.00 | 0.00 |
| **Crest El. (ft)** | = 47.10 | 0.00 | 0.00 | 0.00 |
| **Weir Coeff.** | = 3.33 | 3.33 | 3.33 | 3.33 |
| **Weir Type** | = Rect | --- | --- | --- |
| **Multi-Stage** | = Yes | No | No | No |

**Exfil.(in/hr)** = 1.500 (by Wet area)
**TW Elev. (ft)** = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

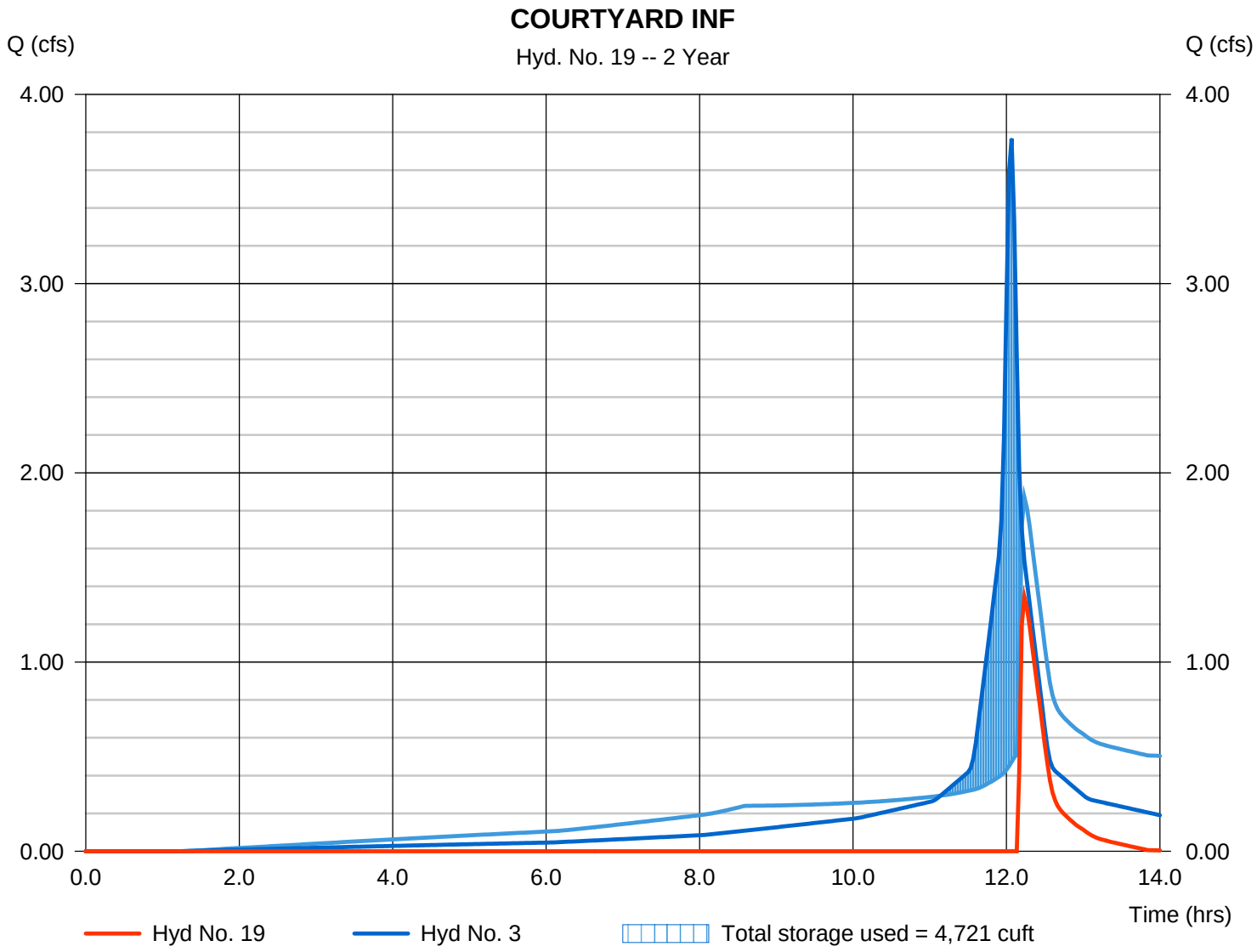
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 19

COURTYARD INF

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 1.342 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.23 hrs |
| Time interval | = 2 min | Hyd. volume | = 1,786 cuft |
| Inflow hyd. No. | = 3 - PR WS 03B | Max. Elevation | = 45.59 ft |
| Reservoir name | = Courtyard | Max. Storage | = 4,721 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Pond No. 1 - Courtyard

### Pond Data

**UG Chambers -**Invert elev. = 43.00 ft, Rise x Span = 2.00 x 2.00 ft, Barrel Len = 52.00 ft, No. Barrels = 10, Slope = 0.00%, Headers = Yes
**Encasement -**Invert elev. = 42.50 ft, Width = 4.70 ft, Height = 3.50 ft, Voids = 40.00%

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 42.50 | n/a | 0 | 0 |
| 0.35 | 42.85 | n/a | 404 | 404 |
| 0.70 | 43.20 | n/a | 464 | 869 |
| 1.05 | 43.55 | n/a | 603 | 1,471 |
| 1.40 | 43.90 | n/a | 651 | 2,122 |
| 1.75 | 44.25 | n/a | 660 | 2,782 |
| 2.10 | 44.60 | n/a | 635 | 3,417 |
| 2.45 | 44.95 | n/a | 561 | 3,978 |
| 2.80 | 45.30 | n/a | 412 | 4,390 |
| 3.15 | 45.65 | n/a | 404 | 4,794 |
| 3.50 | 46.00 | n/a | 404 | 5,198 |

### Culvert / Orifice Structures

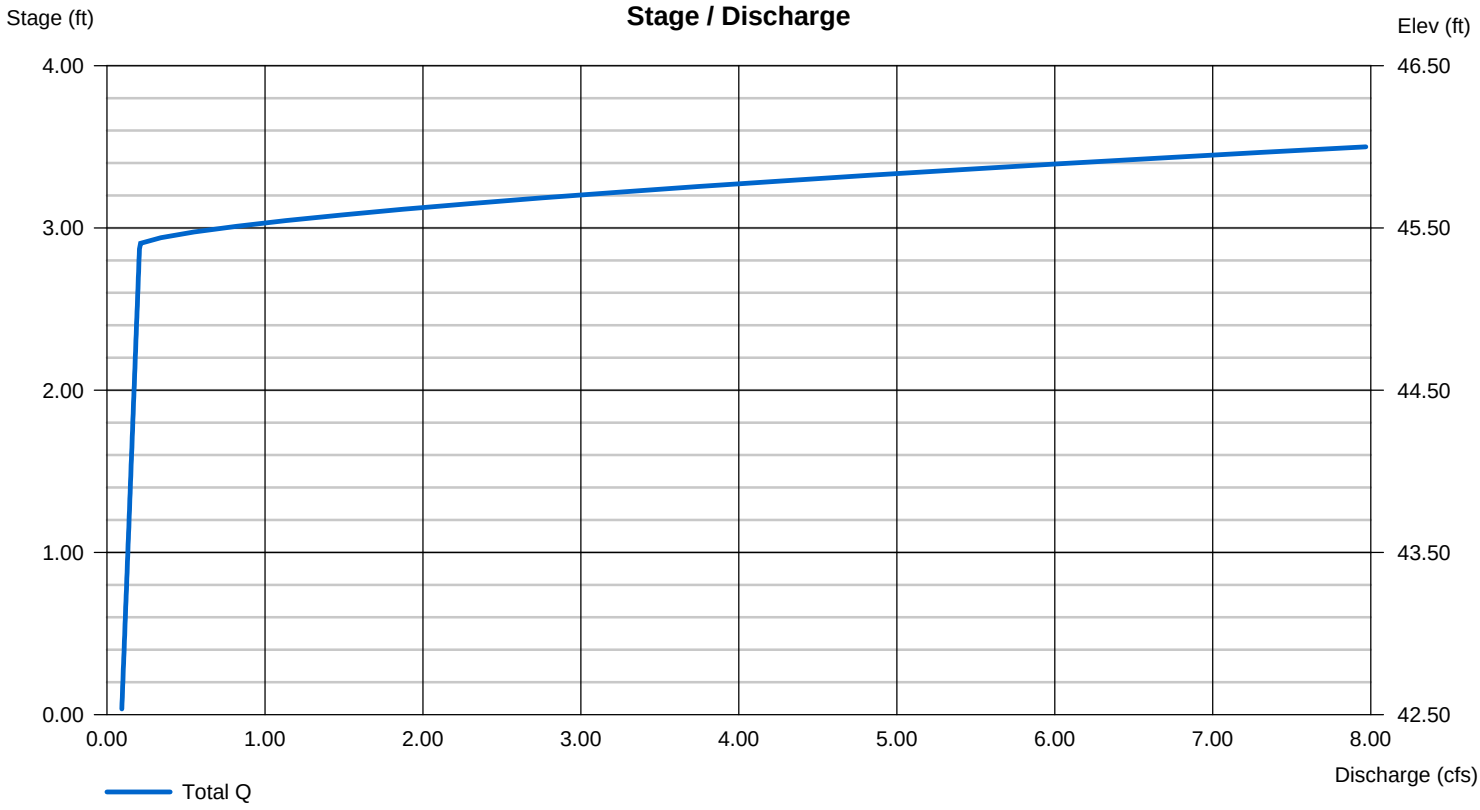
| | [A] | [B] | [C] | [PrfRsr] |
|---|---|---|---|---|
| **Rise (in)** | = 18.00 | Inactive | 0.00 | 0.00 |
| **Span (in)** | = 18.00 | 7.00 | 0.00 | 0.00 |
| **No. Barrels** | = 1 | 1 | 0 | 0 |
| **Invert El. (ft)** | = 42.86 | 44.95 | 0.00 | 0.00 |
| **Length (ft)** | = 93.00 | 0.00 | 0.00 | 0.00 |
| **Slope (%)** | = 2.00 | 0.00 | 0.00 | n/a |
| **N-Value** | = .011 | .012 | .013 | n/a |
| **Orifice Coeff.** | = 0.60 | 0.60 | 0.60 | 0.60 |
| **Multi-Stage** | = n/a | Yes | No | No |

### Weir Structures

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| **Crest Len (ft)** | = 5.00 | Inactive | Inactive | 0.00 |
| **Crest El. (ft)** | = 45.40 | 45.30 | 45.00 | 0.00 |
| **Weir Coeff.** | = 3.33 | 3.33 | 2.54 | 3.33 |
| **Weir Type** | = Rect | Rect | 90 degV | --- |
| **Multi-Stage** | = Yes | Yes | Yes | No |

**Exfil.(in/hr)** = 1.500 (by Wet area)
**TW Elev. (ft)** = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Report

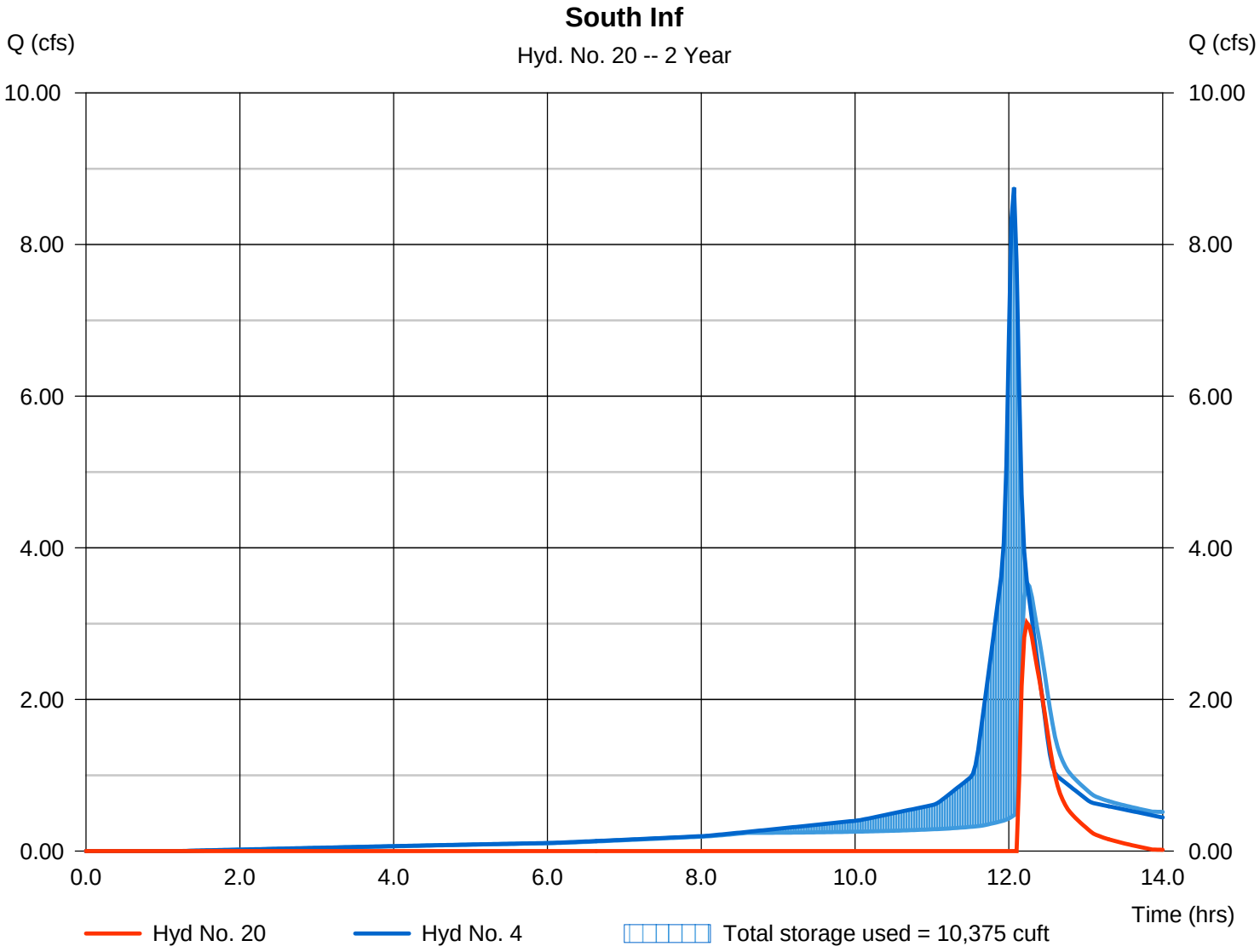
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 20

South Inf

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 3.011 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 12.23 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 4,884 cuft |
| Inflow hyd. No. | = | 4 - PR WS 03D | Max. Elevation | = | 43.83 ft |
| Reservoir name | = | SOUTH INF | Max. Storage | = | 10,375 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Pond No. 2 - SOUTH INF

### Pond Data

**UG Chambers -**Invert elev. = 42.00 ft, Rise x Span = 2.00 x 2.00 ft, Barrel Len = 495.00 ft, No. Barrels = 3, Slope = 0.00%, Headers = No
**Encasement -**Invert elev. = 41.00 ft, Width = 4.58 ft, Height = 4.00 ft, Voids = 40.00%

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 41.00 | n/a | 0 | 0 |
| 0.40 | 41.40 | n/a | 1,088 | 1,088 |
| 0.80 | 41.80 | n/a | 1,088 | 2,177 |
| 1.20 | 42.20 | n/a | 1,234 | 3,411 |
| 1.60 | 42.60 | n/a | 1,649 | 5,060 |
| 2.00 | 43.00 | n/a | 1,782 | 6,842 |
| 2.40 | 43.40 | n/a | 1,782 | 8,624 |
| 2.80 | 43.80 | n/a | 1,649 | 10,273 |
| 3.20 | 44.20 | n/a | 1,234 | 11,507 |
| 3.60 | 44.60 | n/a | 1,088 | 12,596 |
| 4.00 | 45.00 | n/a | 1,088 | 13,684 |

### Culvert / Orifice Structures

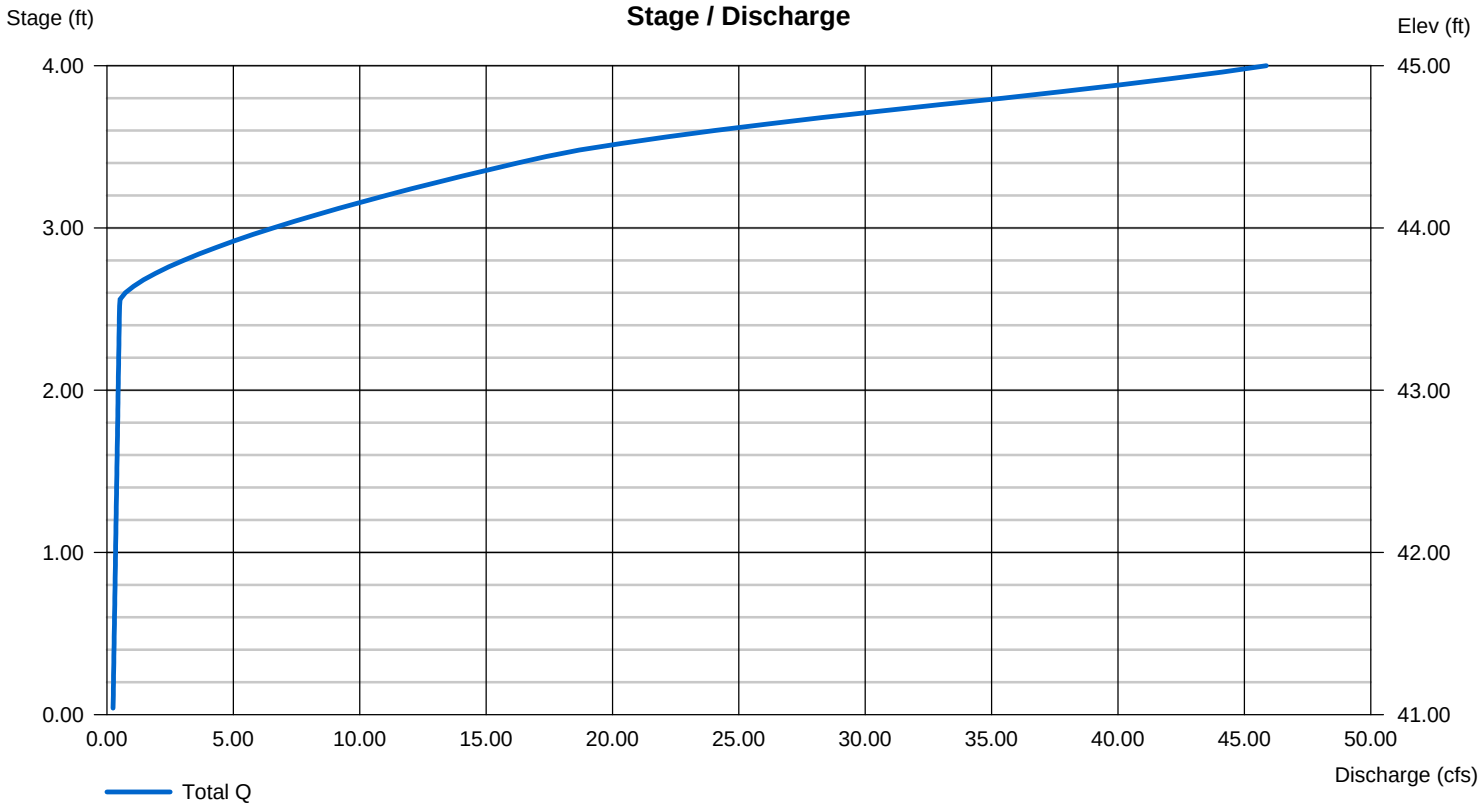
| | [A] | [B] | [C] | [PrfRsr] |
|---|---|---|---|---|
| **Rise (in)** | = 24.00 | Inactive | Inactive | 0.00 |
| **Span (in)** | = 24.00 | 24.00 | 6.00 | 0.00 |
| **No. Barrels** | = 2 | 2 | 1 | 0 |
| **Invert El. (ft)** | = 40.85 | 43.70 | 43.10 | 0.00 |
| **Length (ft)** | = 3.00 | 0.00 | 0.00 | 0.00 |
| **Slope (%)** | = 1.00 | 0.00 | 0.00 | n/a |
| **N-Value** | = .012 | .012 | .013 | n/a |
| **Orifice Coeff.** | = 0.60 | 0.60 | 0.60 | 0.60 |
| **Multi-Stage** | = n/a | Yes | Yes | No |

### Weir Structures

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| **Crest Len (ft)** | = 10.00 | 6.00 | Inactive | 0.00 |
| **Crest El. (ft)** | = 44.45 | 43.55 | 43.80 | 0.00 |
| **Weir Coeff.** | = 3.33 | 3.33 | 3.33 | 3.33 |
| **Weir Type** | = Rect | Rect | Ciplti | --- |
| **Multi-Stage** | = Yes | Yes | Yes | No |

**Exfil.(in/hr)** = 1.500 (by Wet area)
**TW Elev. (ft)** = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



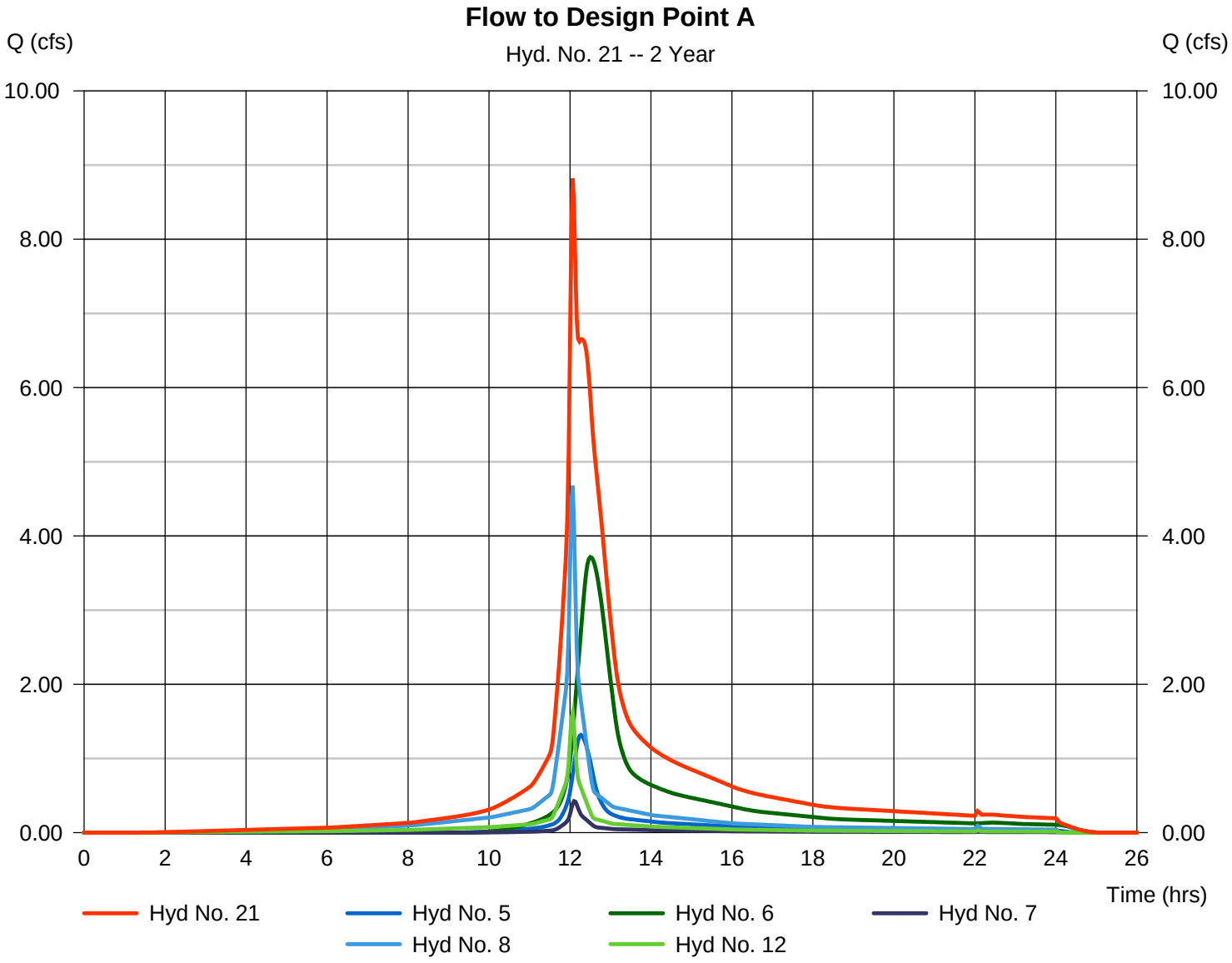
# Hydrograph Report



## Hyd. No. 21

Flow to Design Point A

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 8.817 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 52,510 cuft |
| Inflow hyds. | = 5, 6, 7, 8, 12 | Contrib. drain. area | = 7.410 ac |



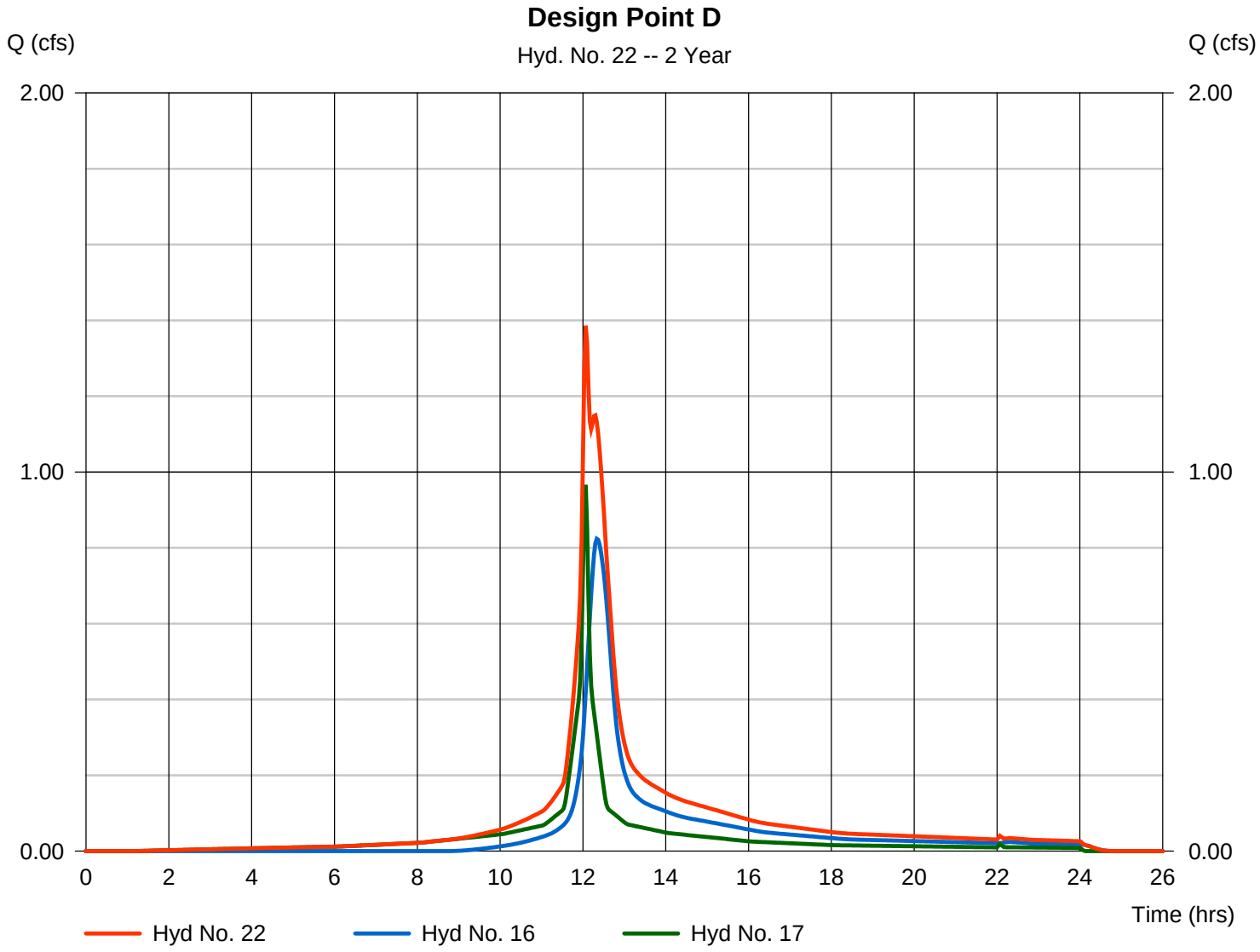
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 22

Design Point D

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 1.386 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 7,597 cuft |
| Inflow hyds. | = 16, 17 | Contrib. drain. area | = 0.971 ac |



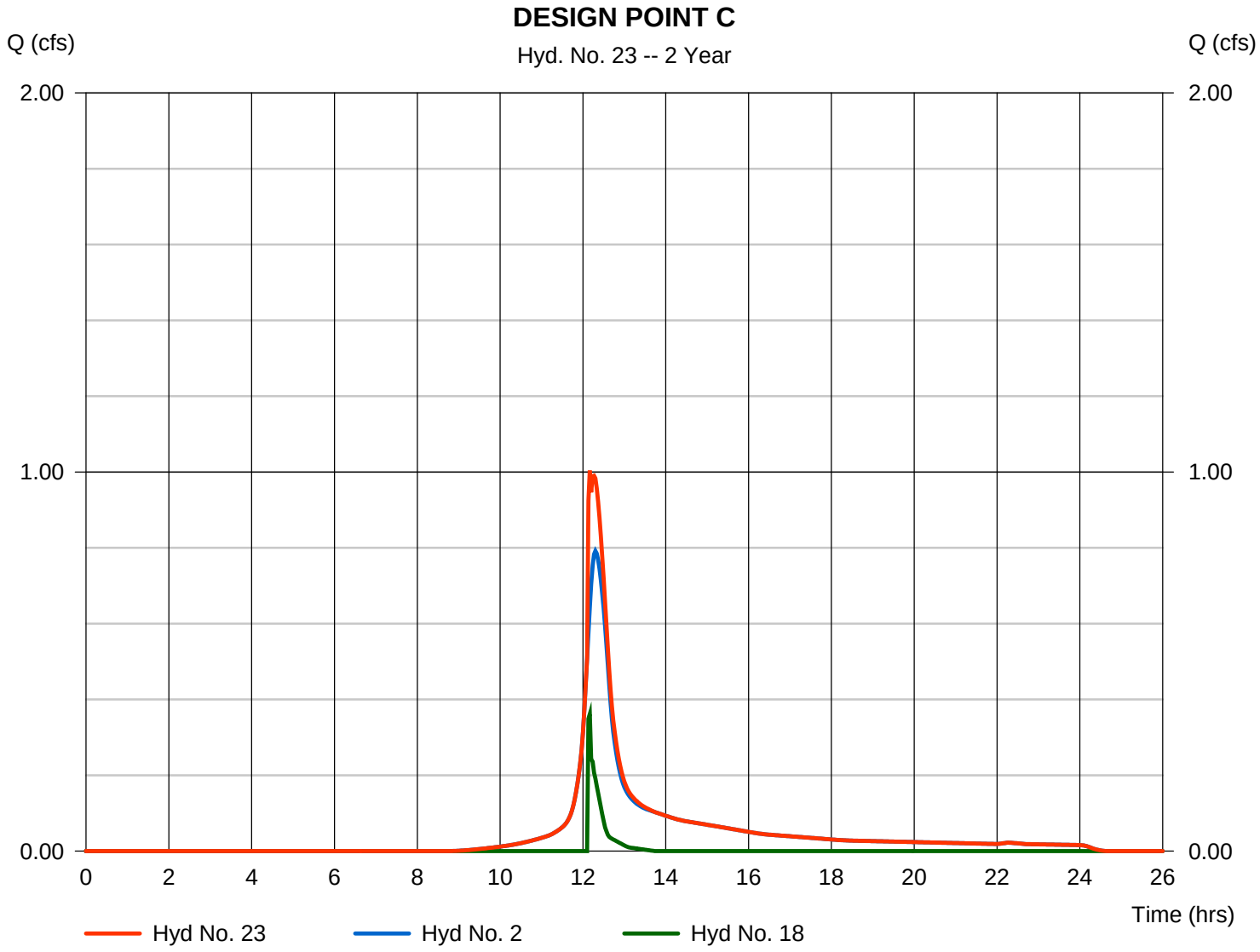
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 23

DESIGN POINT C

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 1.004 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.17 hrs |
| Time interval | = 2 min | Hyd. volume | = 4,264 cuft |
| Inflow hyds. | = 2, 18 | Contrib. drain. area | = 0.626 ac |



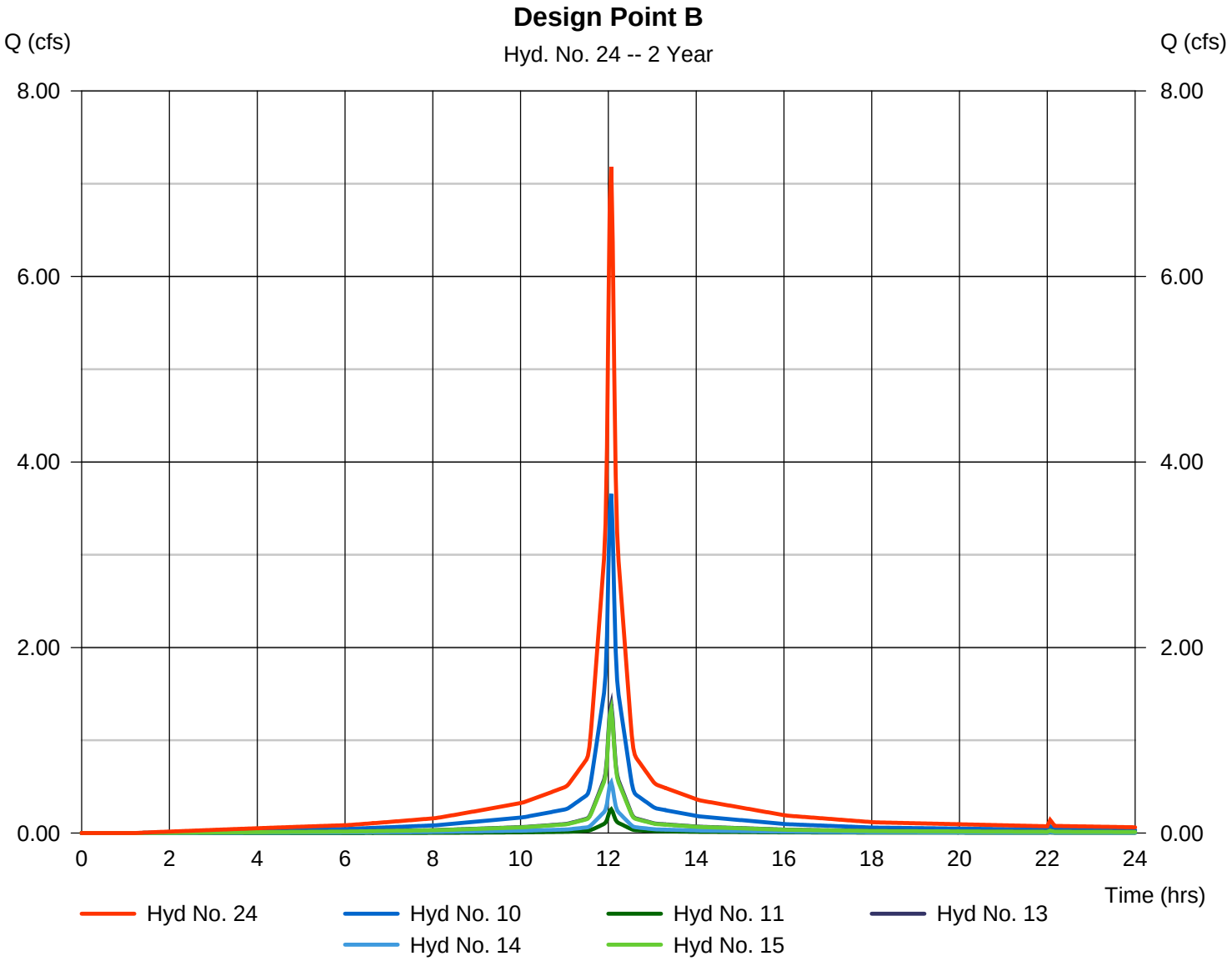
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 24

Design Point B

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Combine | Peak discharge | = | 7.182 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 24,259 cuft |
| Inflow hyds. | = | 10, 11, 13, 14, 15 | Contrib. drain. area | = | 2.169 ac |



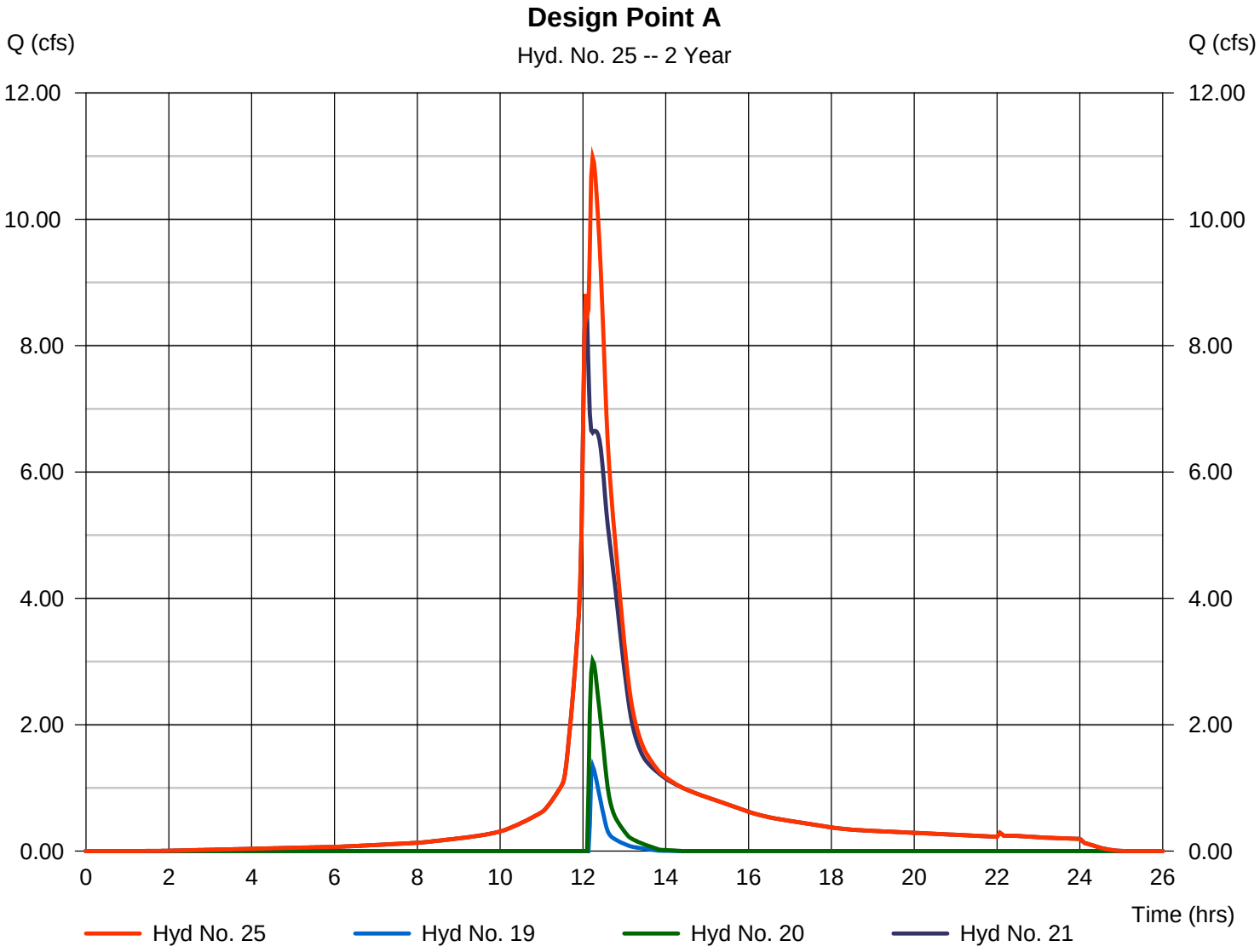
# Hydrograph Report



## Hyd. No. 25

Design Point A

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 10.98 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 12.23 hrs |
| Time interval | = 2 min | Hyd. volume | = 59,180 cuft |
| Inflow hyds. | = 19, 20, 21 | Contrib. drain. area | = 0.000 ac |



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SCS Runoff | 0.978 | 2 | 724 | 3,373 | ------ | ------ | ------ | PR WS 01A Des. PT. C |
| 2 | SCS Runoff | 1.515 | 2 | 738 | 7,474 | ------ | ------ | ------ | PR WS 01 Des. PT. C |
| 3 | SCS Runoff | 5.763 | 2 | 724 | 19,870 | ------ | ------ | ------ | PR WS 03B |
| 4 | SCS Runoff | 13.39 | 2 | 724 | 46,171 | ------ | ------ | ------ | PR WS 03D |
| 5 | SCS Runoff | 2.565 | 2 | 736 | 12,144 | ------ | ------ | ------ | PR WS 03A |
| 6 | SCS Runoff | 7.507 | 2 | 750 | 47,295 | ------ | ------ | ------ | OFFSITE 01 |
| 7 | SCS Runoff | 0.857 | 2 | 726 | 2,927 | ------ | ------ | ------ | OFFSITE 02 |
| 8 | SCS Runoff | 7.208 | 2 | 724 | 24,435 | ------ | ------ | ------ | PR WS 03C |
| 9 | SCS Runoff | 1.080 | 2 | 724 | 3,725 | ------ | ------ | ------ | PR WS 09 |
| 10 | SCS Runoff | 5.595 | 2 | 724 | 19,291 | ------ | ------ | ------ | PR WS 06 |
| 11 | SCS Runoff | 0.420 | 2 | 724 | 1,324 | ------ | ------ | ------ | PR WS 08 |
| 12 | SCS Runoff | 2.471 | 2 | 724 | 8,521 | ------ | ------ | ------ | PR WS 05 |
| 13 | SCS Runoff | 2.125 | 2 | 724 | 7,326 | ------ | ------ | ------ | PR WS 02 |
| 14 | SCS Runoff | 0.836 | 2 | 724 | 2,881 | ------ | ------ | ------ | PR WS 02A |
| 15 | SCS Runoff | 2.043 | 2 | 724 | 7,045 | ------ | ------ | ------ | PR WS 07 |
| 16 | SCS Runoff | 1.580 | 2 | 740 | 8,260 | ------ | ------ | ------ | PR WS 04 |
| 17 | SCS Runoff | 1.478 | 2 | 724 | 5,095 | ------ | ------ | ------ | PR WS 04A |
| 18 | Reservoir | 0.930 | 2 | 724 | 1,189 | 1 | 47.25 | 740 | Design Point C Storage |
| 19 | Reservoir | 5.335 | 2 | 724 | 6,781 | 3 | 45.88 | 5,046 | COURTYARD INF |
| 20 | Reservoir | 11.77 | 2 | 726 | 16,182 | 4 | 44.26 | 11,650 | South Inf |
| 21 | Combine | 15.20 | 2 | 724 | 95,322 | 5, 6, 7, 8, 12, | ------ | ------ | Flow to Design Point A |
| 22 | Combine | 2.343 | 2 | 724 | 13,355 | 16, 17, | ------ | ------ | Design Point D |
| 23 | Combine | 1.883 | 2 | 726 | 8,664 | 2, 18, | ------ | ------ | DESIGN POINT C |
| 24 | Combine | 11.02 | 2 | 724 | 37,867 | 10, 11, 13, 14, 15, | ------ | ------ | Design Point B |
| 25 | Combine | 31.81 | 2 | 726 | 118,286 | 19, 20, 21, | ------ | ------ | Design Point A |

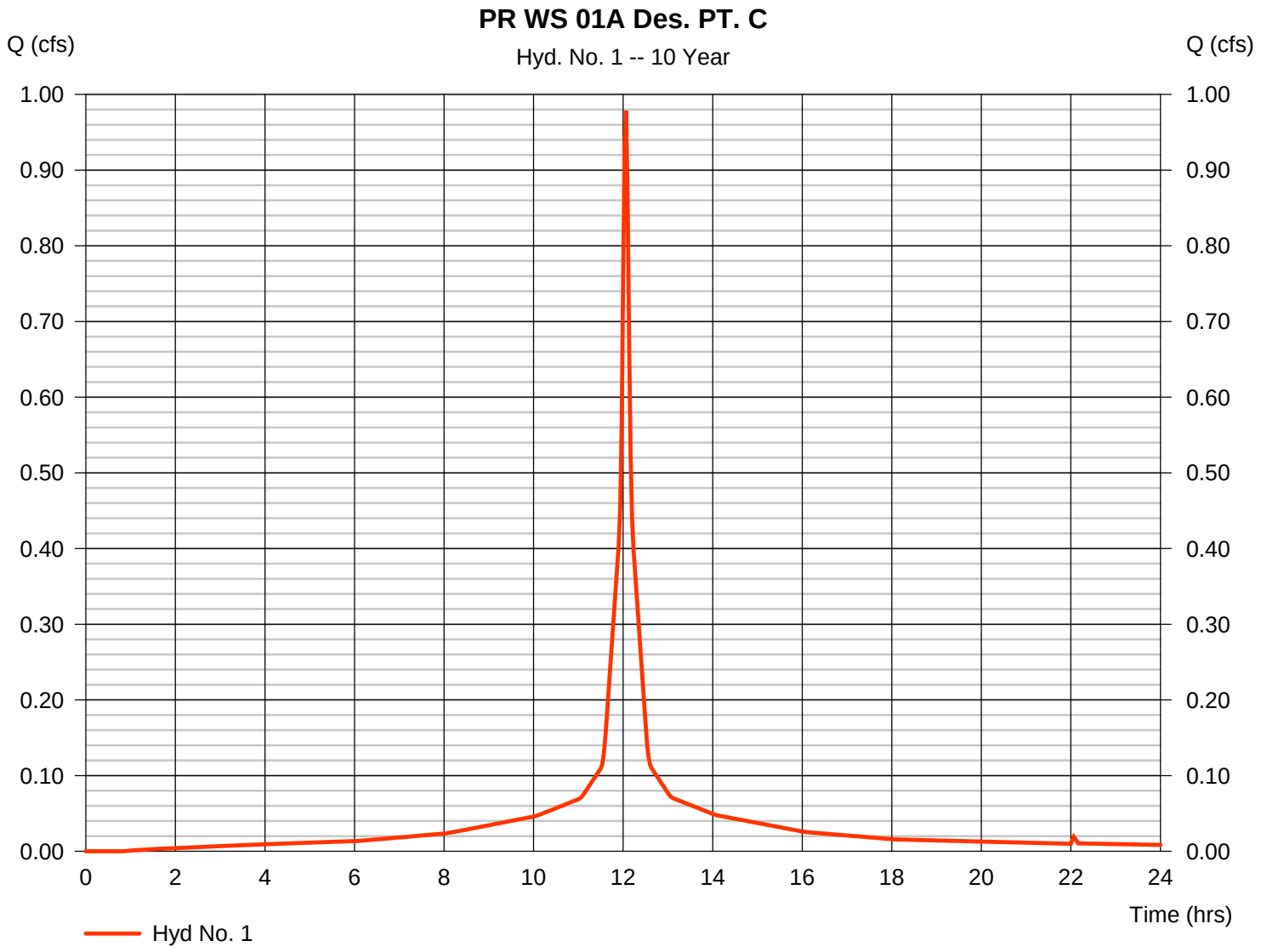
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 1

PR WS 01A Des. PT. C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.978 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 3,373 cuft |
| Drainage area | = 0.192 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



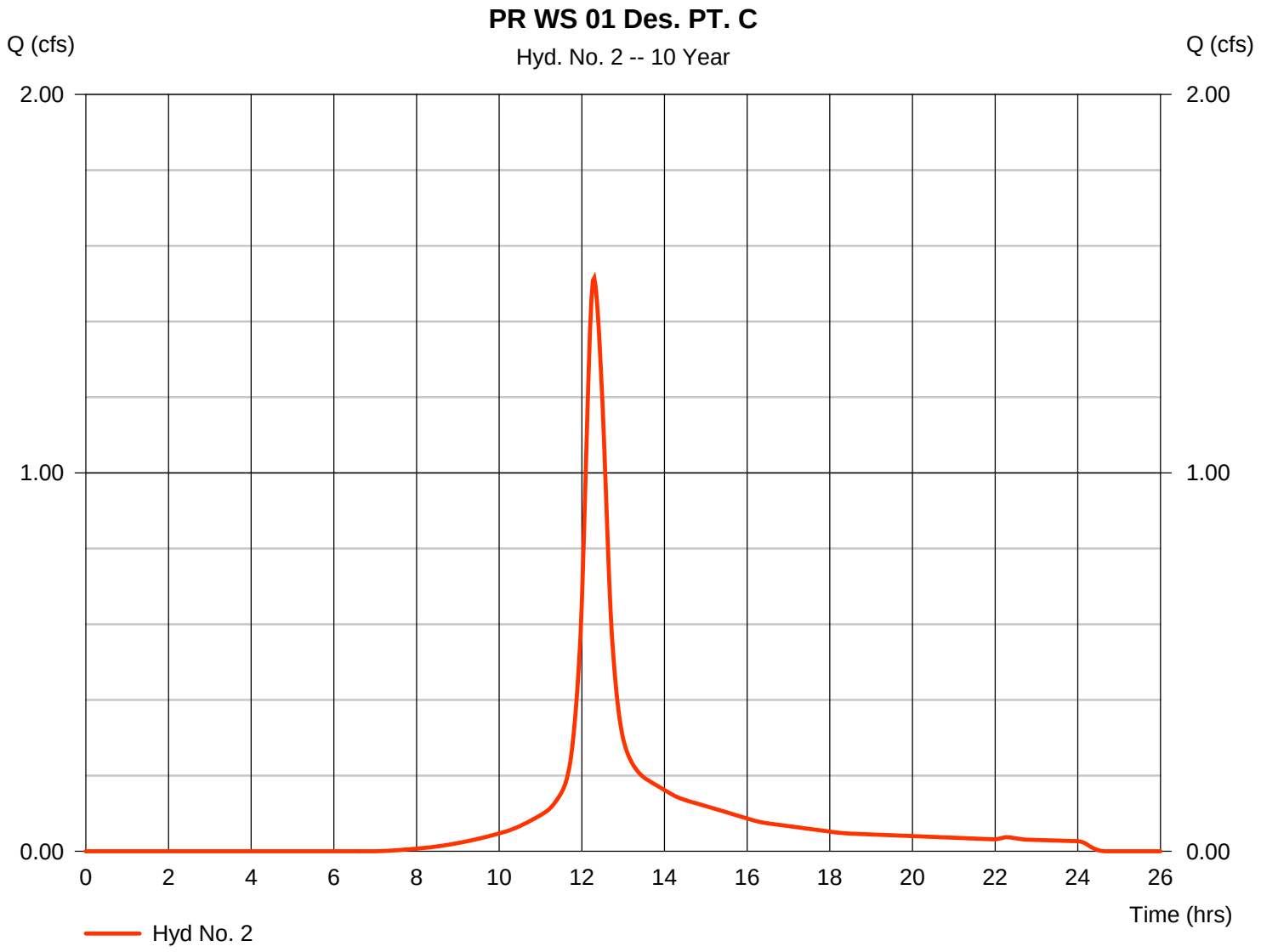
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 2

PR WS 01 Des. PT. C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.515 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.30 hrs |
| Time interval | = 2 min | Hyd. volume | = 7,474 cuft |
| Drainage area | = 0.626 ac | Curve number | = 81 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 25.80 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



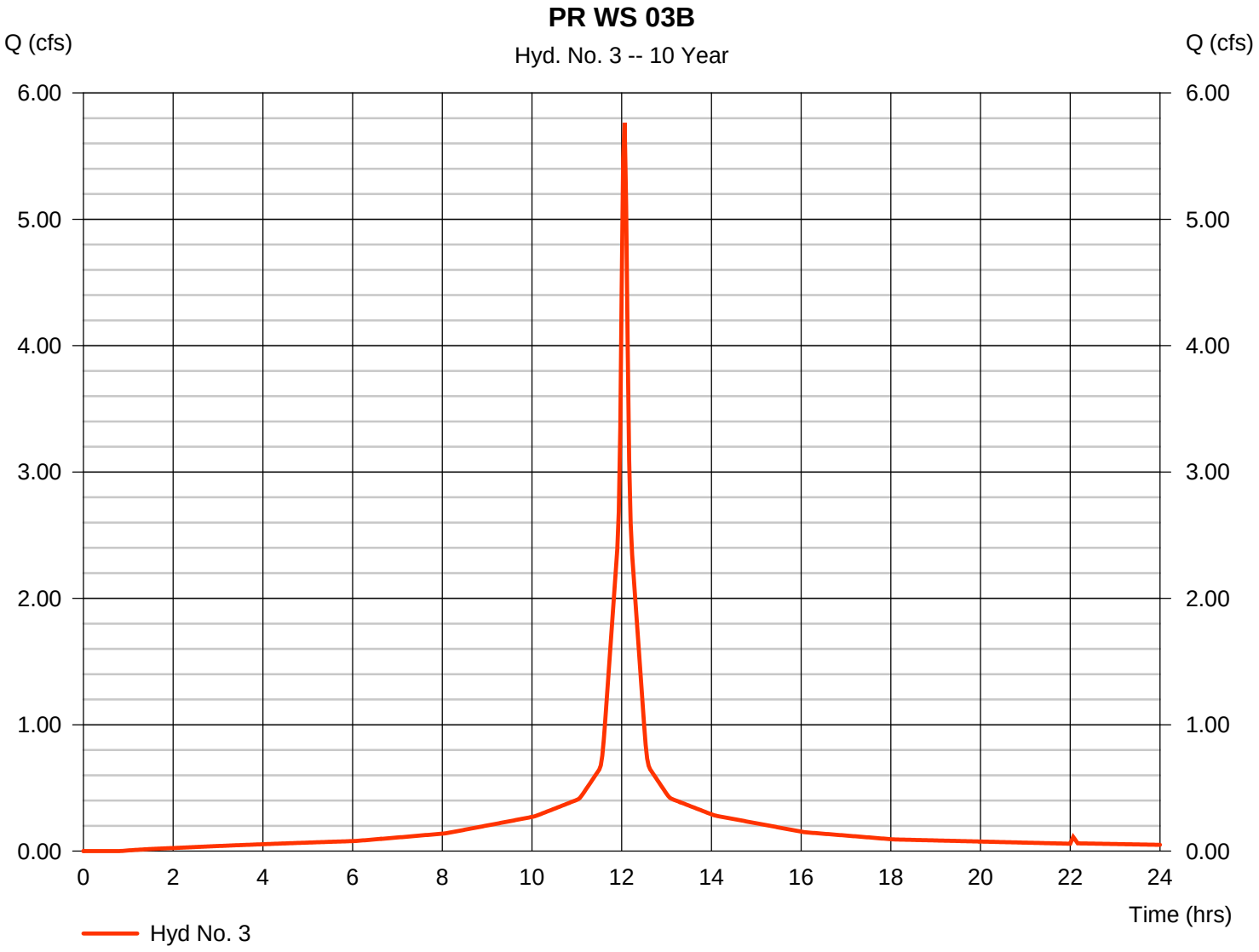
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 3

PR WS 03B

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 5.763 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 19,870 cuft |
| Drainage area | = 1.131 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



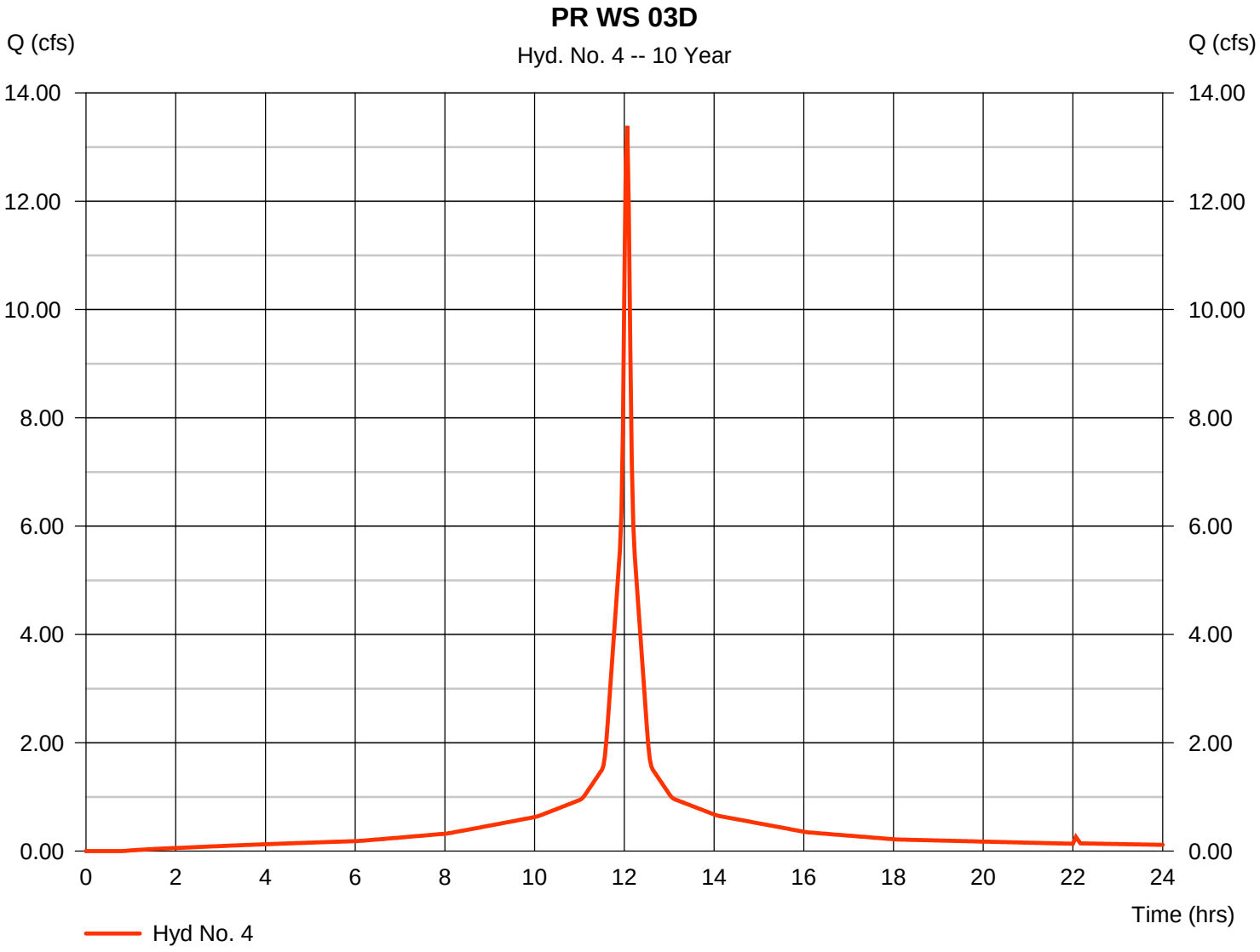
# Hydrograph Report



## Hyd. No. 4

PR WS 03D

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 13.39 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 46,171 cuft |
| Drainage area | = 2.628 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



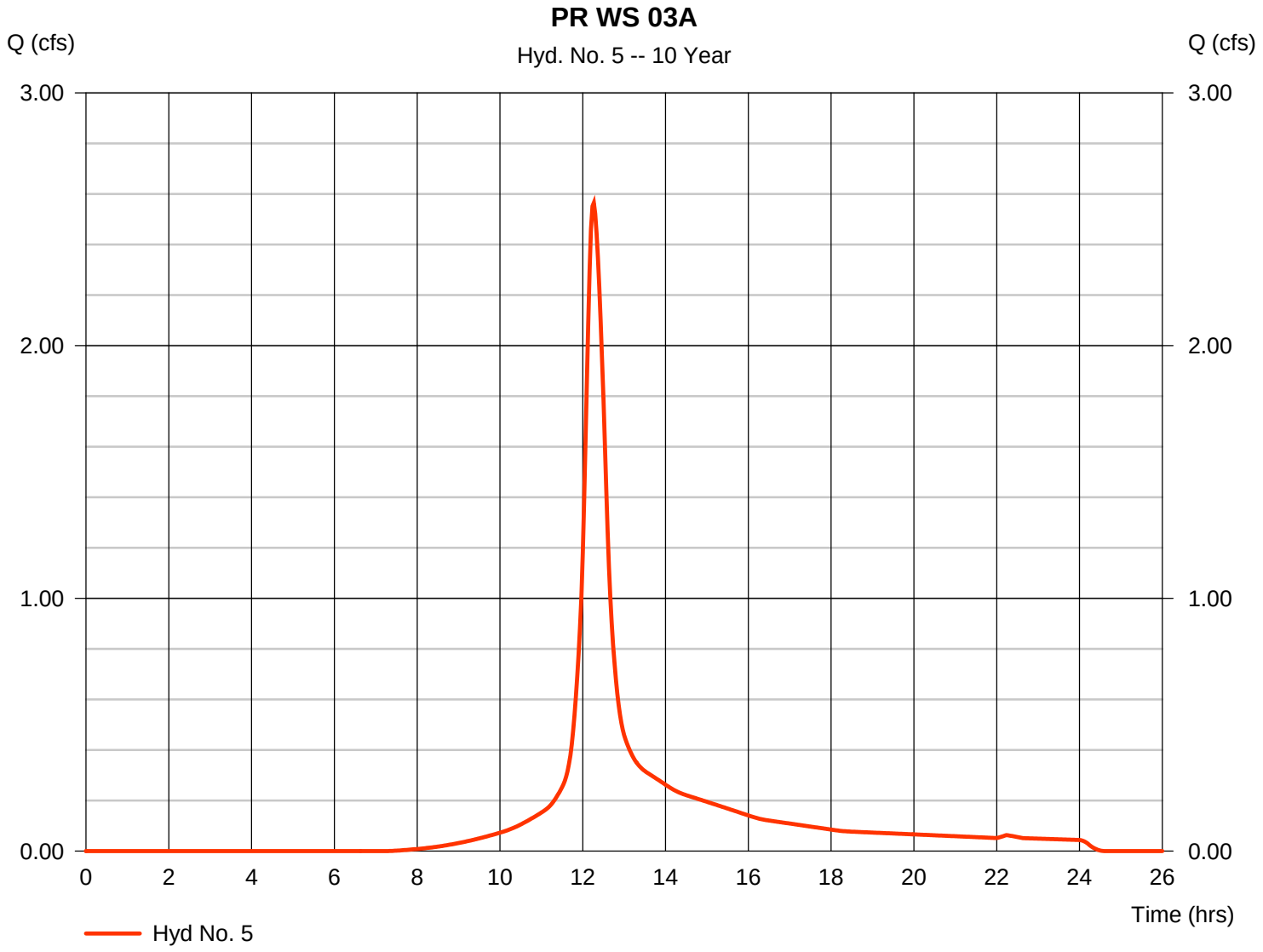
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 5

PR WS 03A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.565 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.27 hrs |
| Time interval | = 2 min | Hyd. volume | = 12,144 cuft |
| Drainage area | = 1.013 ac | Curve number | = 80 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 20.70 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



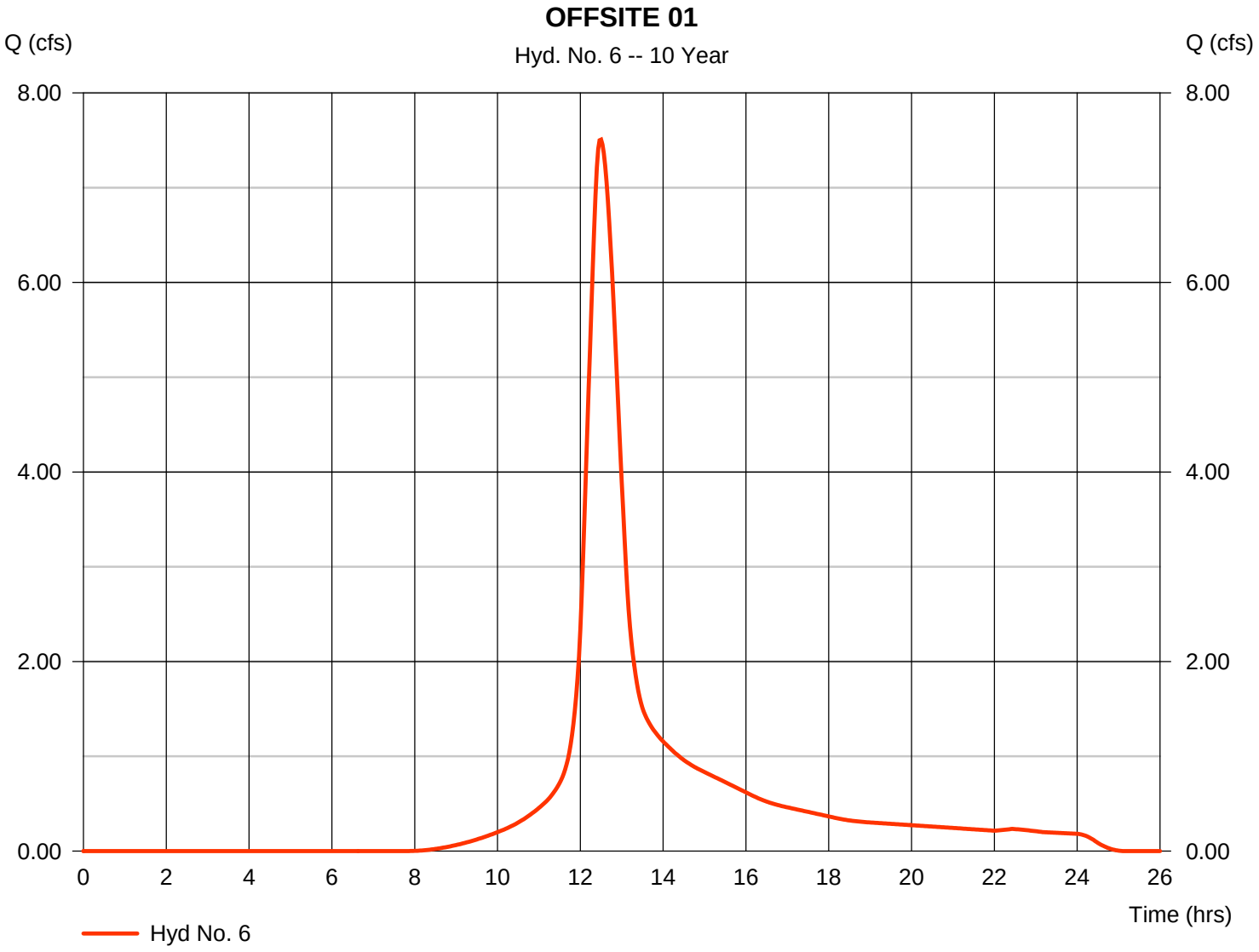
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 6

OFFSITE 01

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 7.507 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.50 hrs |
| Time interval | = 2 min | Hyd. volume | = 47,295 cuft |
| Drainage area | = 4.225 ac | Curve number | = 78 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 41.40 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



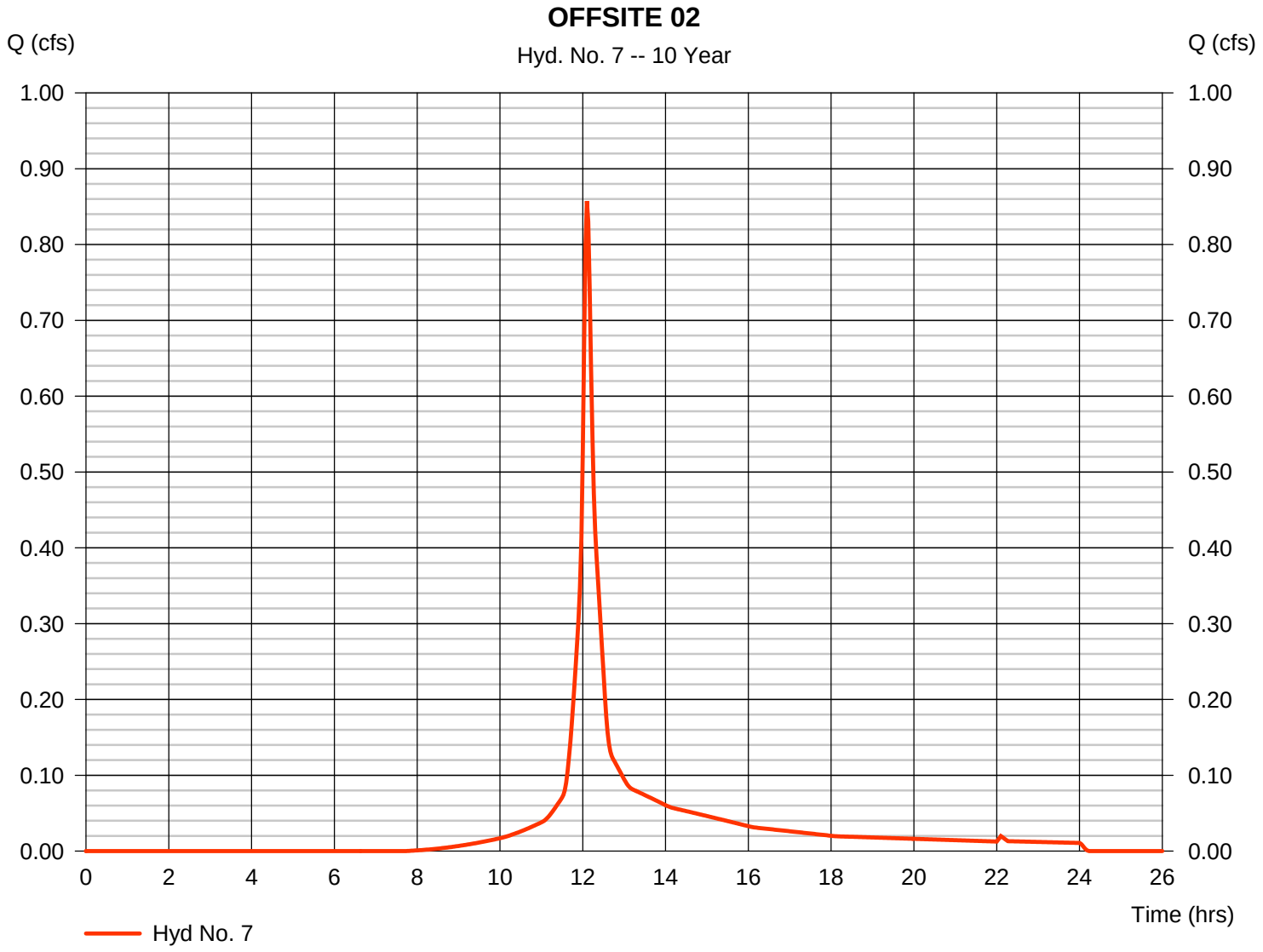
# Hydrograph Report



## Hyd. No. 7

OFFSITE 02

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.857 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.10 hrs |
| Time interval | = 2 min | Hyd. volume | = 2,927 cuft |
| Drainage area | = 0.264 ac | Curve number | = 78 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 7.10 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



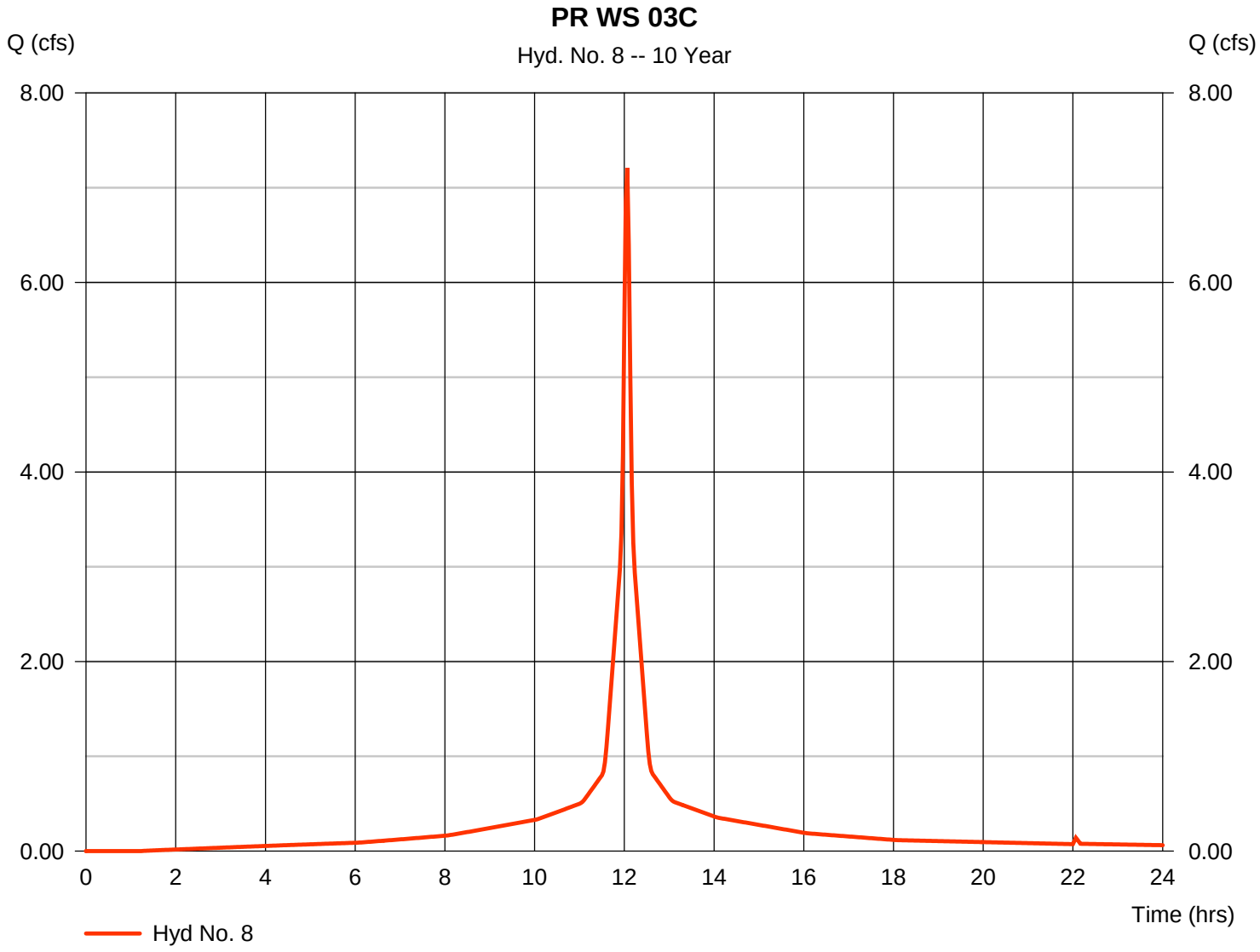
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 8

PR WS 03C

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 7.208 cfs |
| Storm frequency | = | 10 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 24,435 cuft |
| Drainage area | = | 1.423 ac | Curve number | = | 97 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 5.40 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



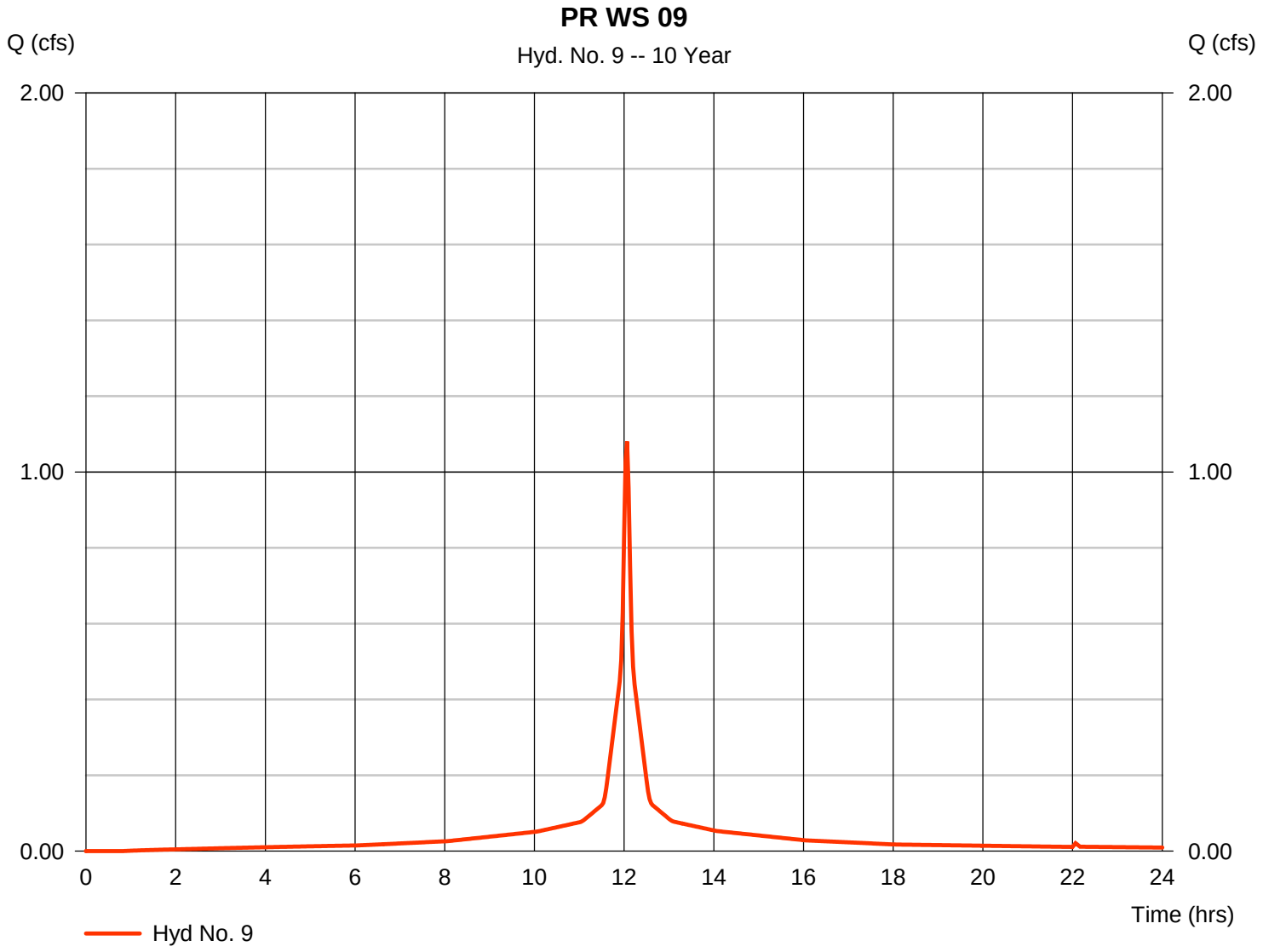
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 9

PR WS 09

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.080 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 3,725 cuft |
| Drainage area | = 0.212 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



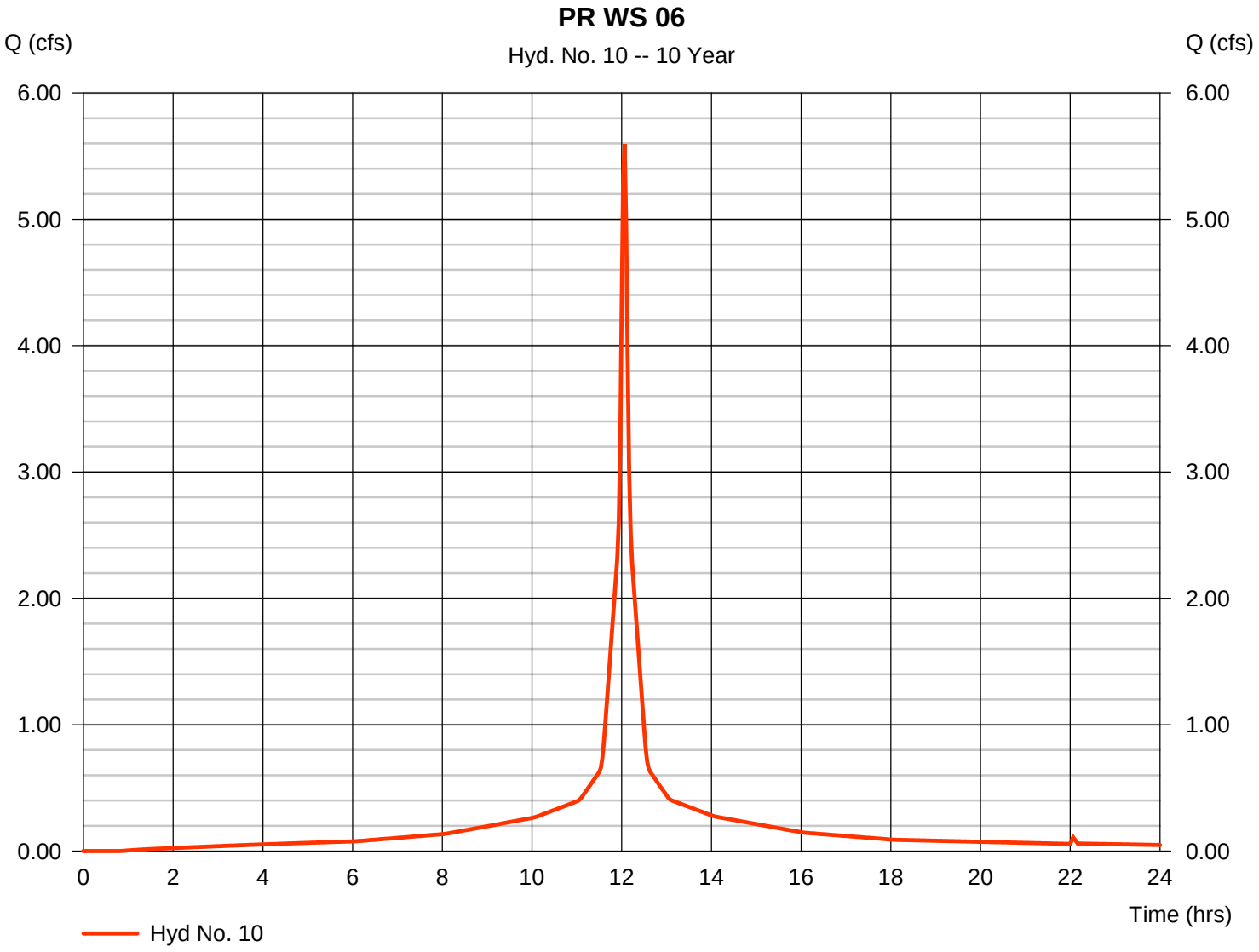
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 10

PR WS 06

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 5.595 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 19,291 cuft |
| Drainage area | = 1.098 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



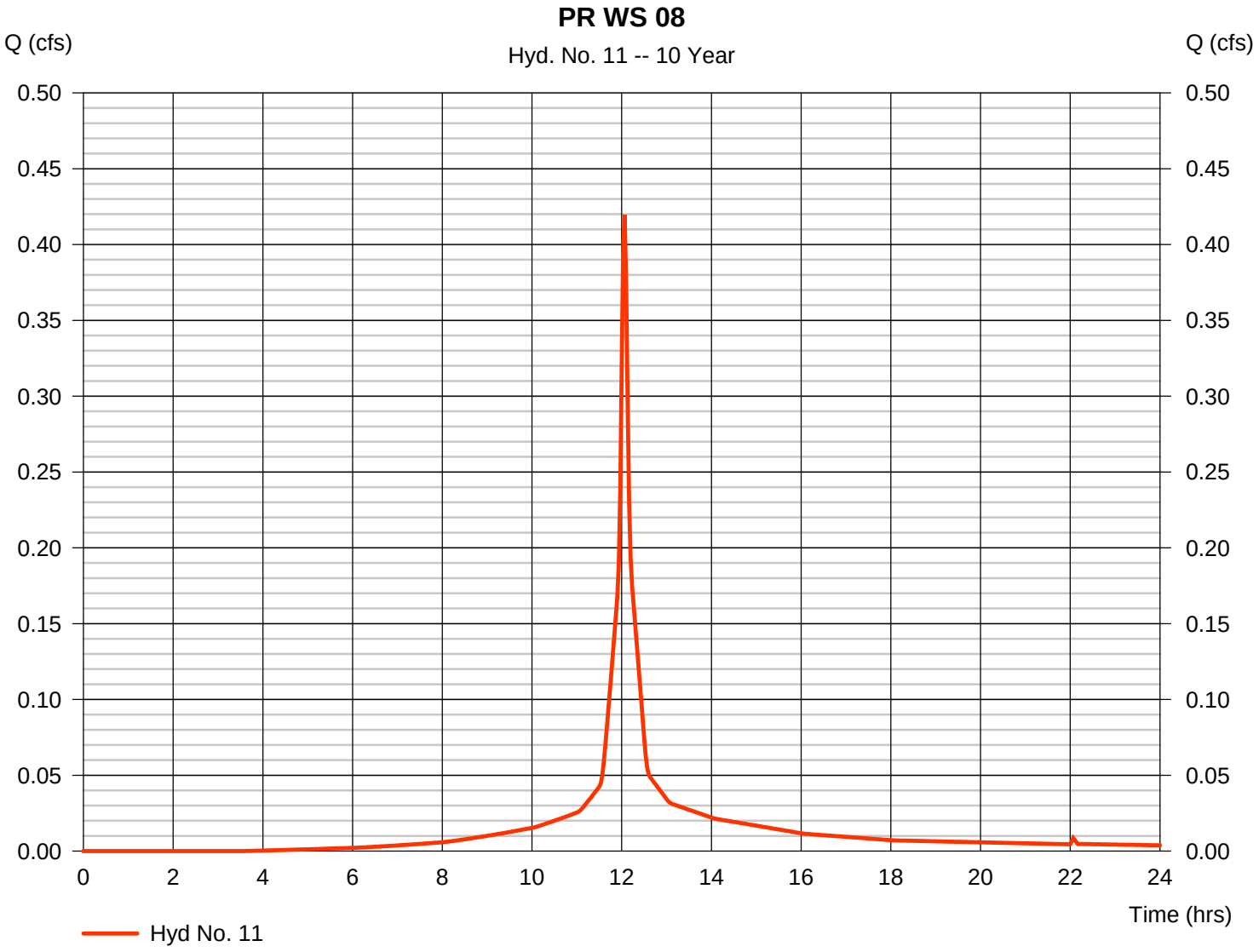
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 11

PR WS 08

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.420 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 1,324 cuft |
| Drainage area | = 0.089 ac | Curve number | = 91 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



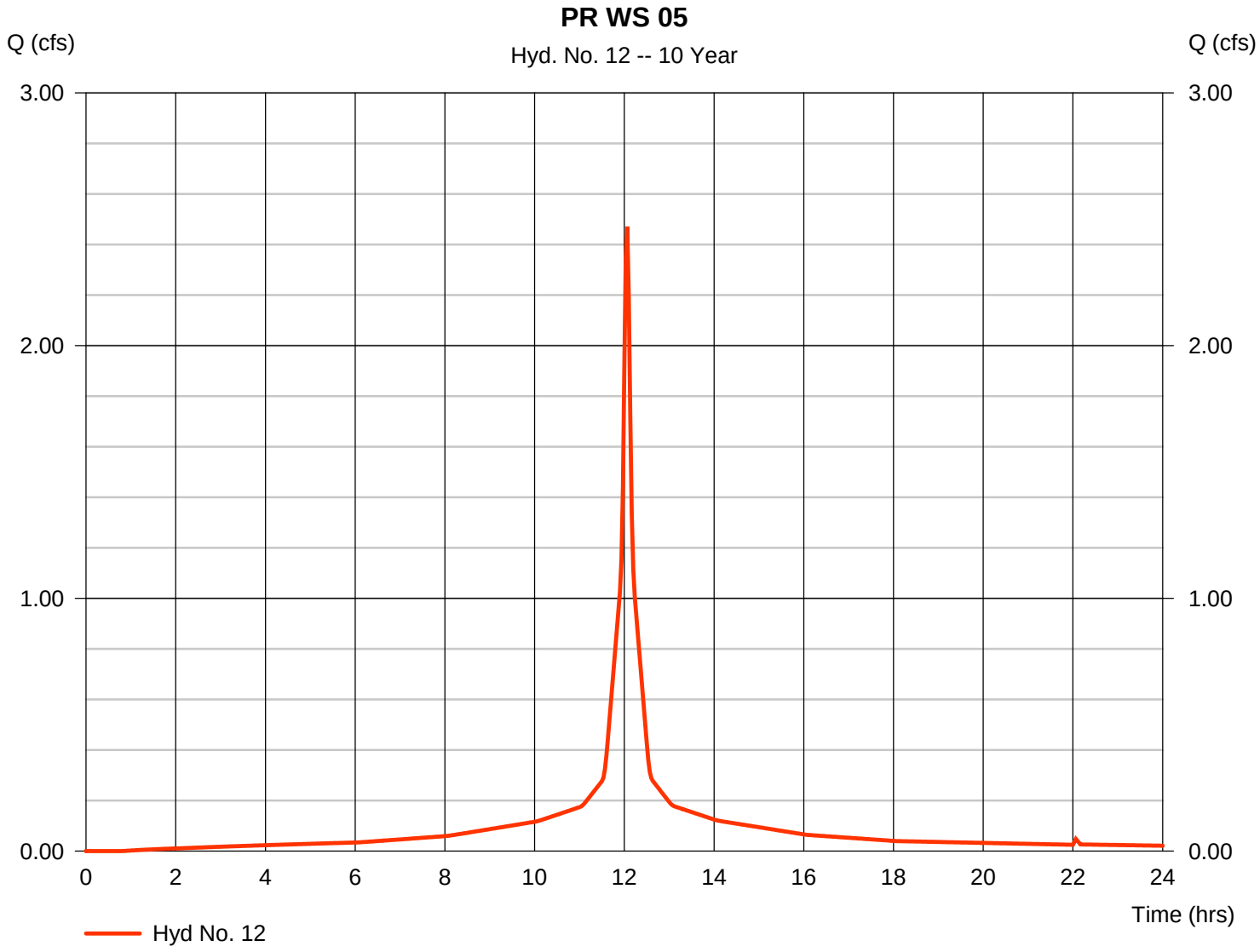
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 12

PR WS 05

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 2.471 cfs |
| Storm frequency | = | 10 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 8,521 cuft |
| Drainage area | = | 0.485 ac | Curve number | = | 98 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 5.40 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



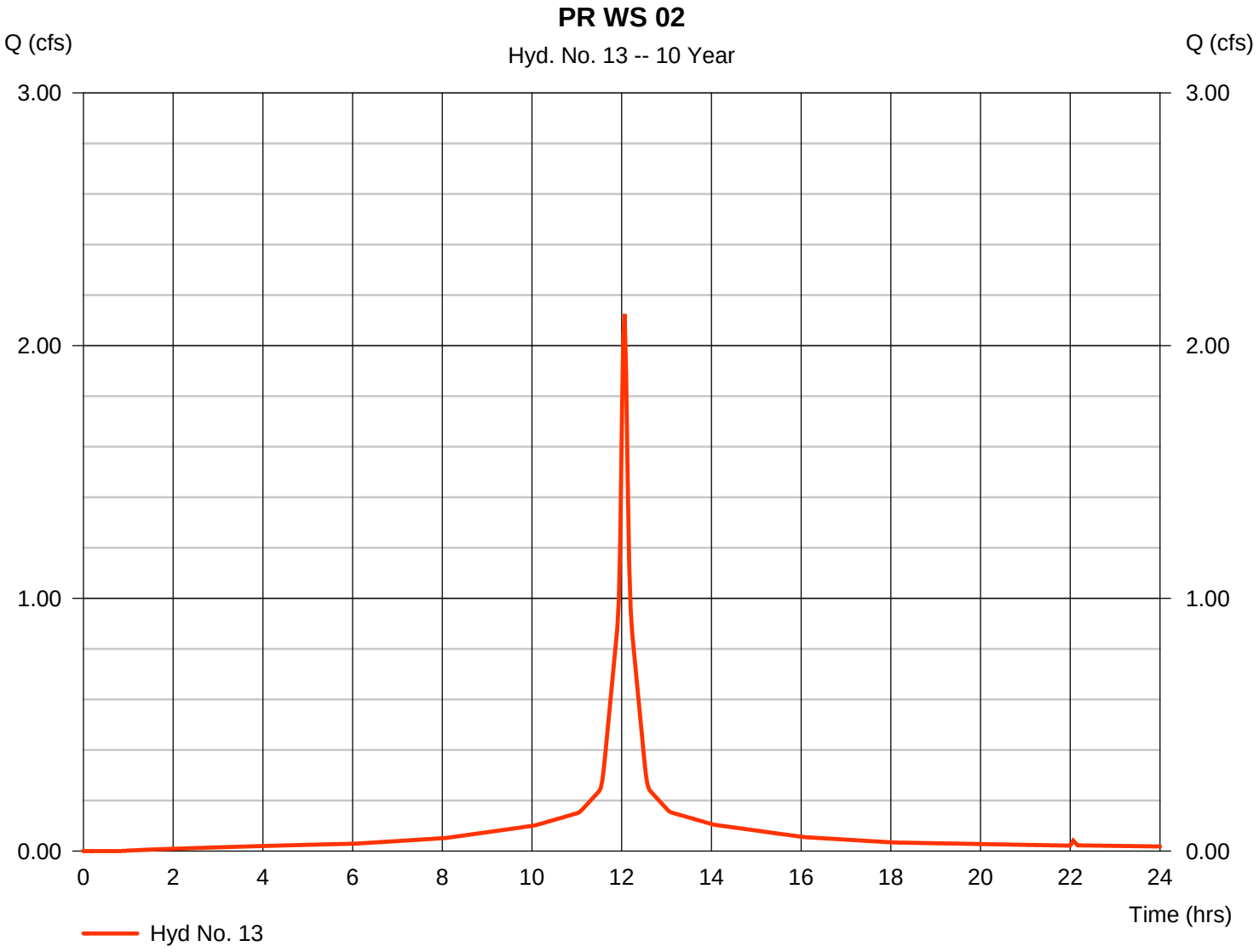
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 13

PR WS 02

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.125 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 7,326 cuft |
| Drainage area | = 0.417 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



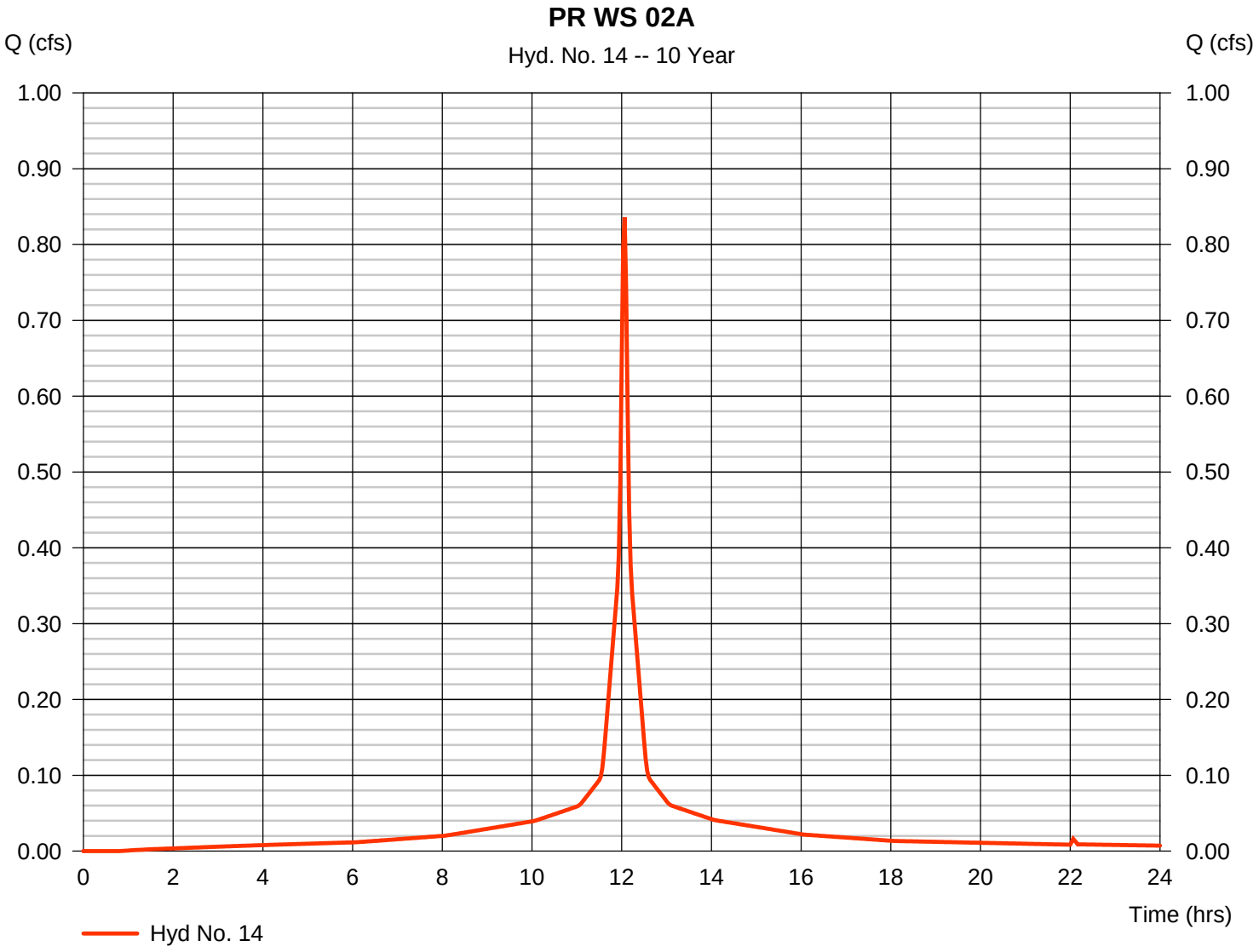
# Hydrograph Report



## Hyd. No. 14

PR WS 02A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.836 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 2,881 cuft |
| Drainage area | = 0.164 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



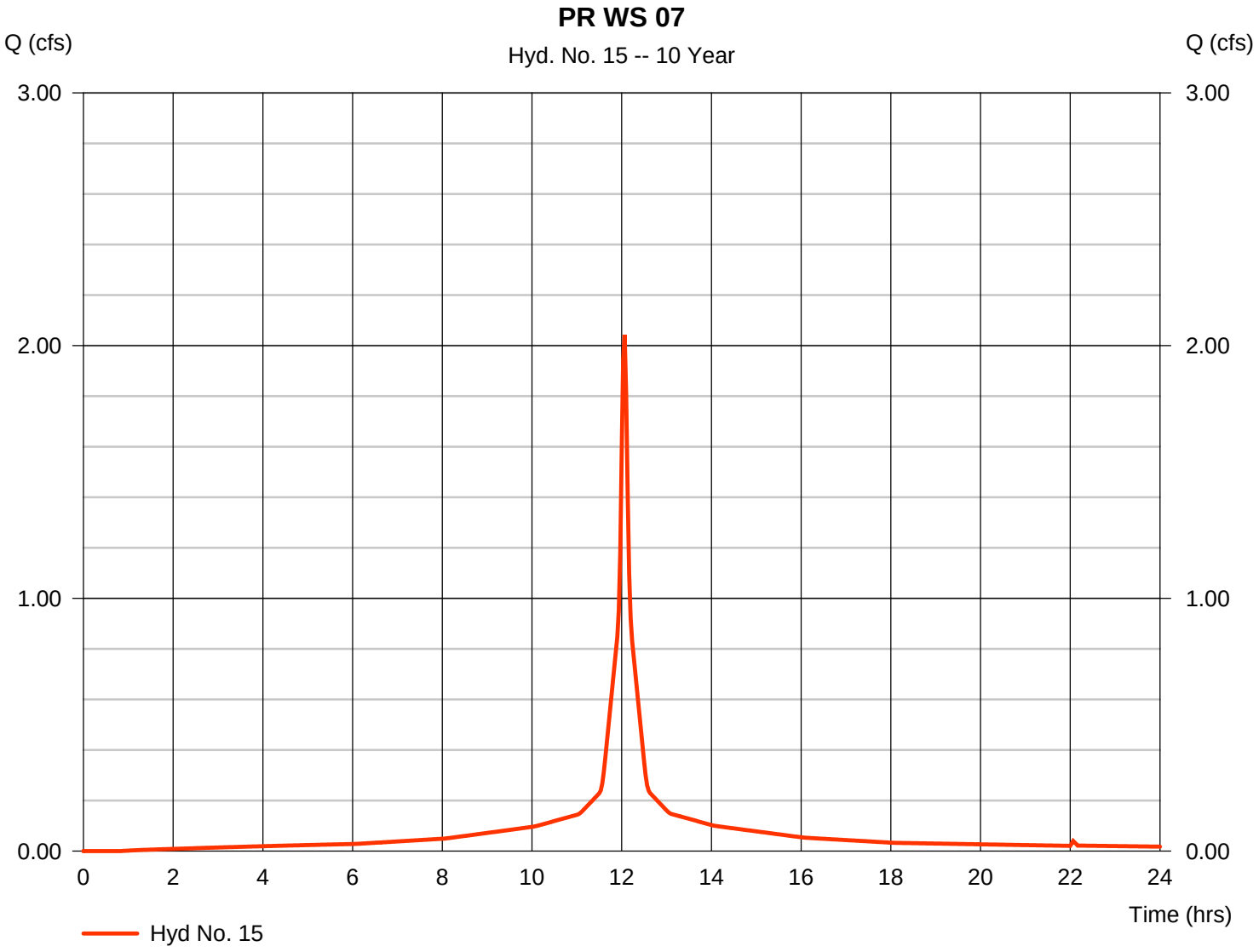
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 15

PR WS 07

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.043 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 7,045 cuft |
| Drainage area | = 0.401 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



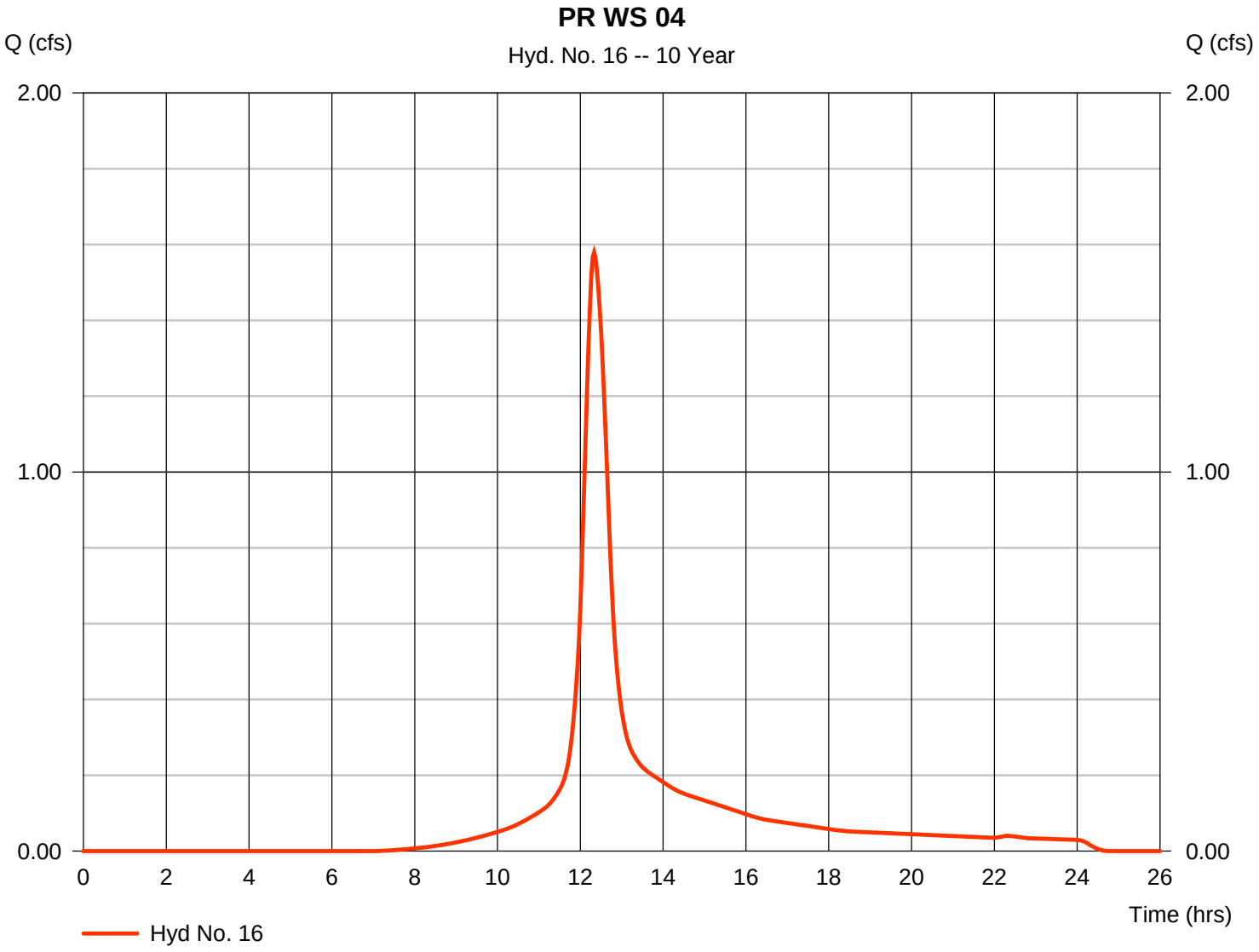
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 16

PR WS 04

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.580 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.33 hrs |
| Time interval | = 2 min | Hyd. volume | = 8,260 cuft |
| Drainage area | = 0.681 ac | Curve number | = 81 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 29.80 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



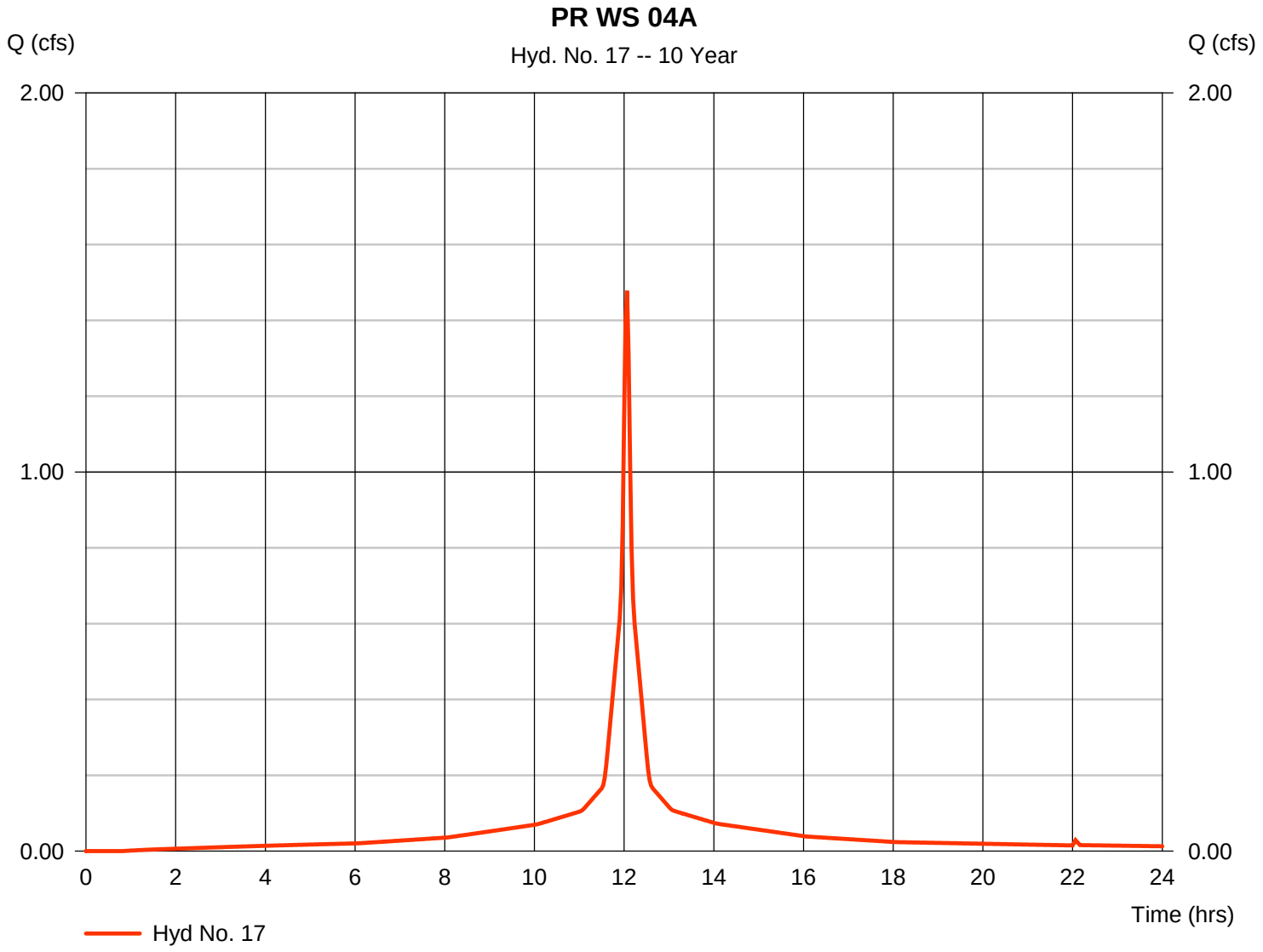
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 17

PR WS 04A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.478 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 5,095 cuft |
| Drainage area | = 0.290 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



# Hydrograph Report

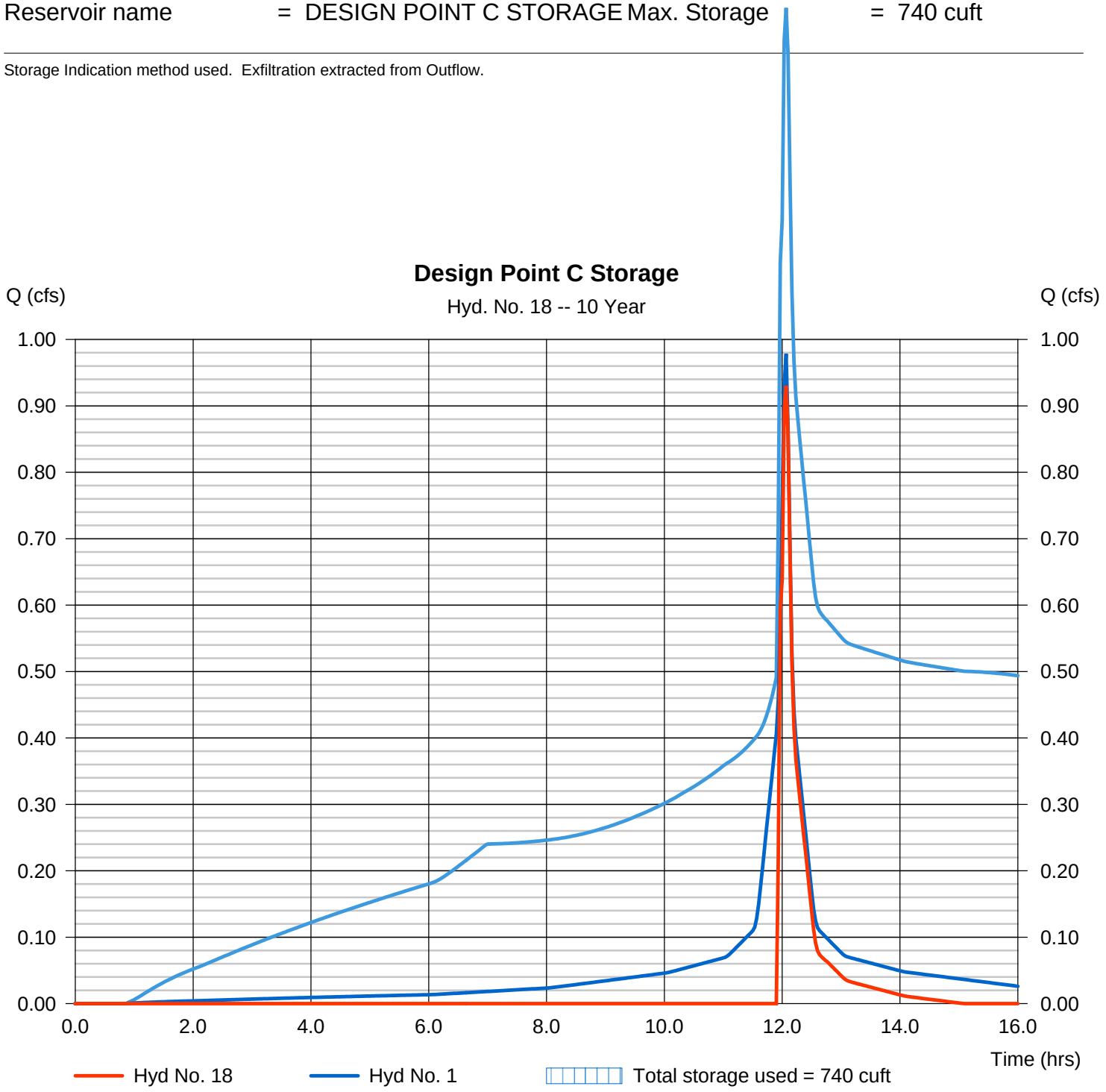
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 18

Design Point C Storage

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 0.930 cfs |
| Storm frequency | = | 10 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 1,189 cuft |
| Inflow hyd. No. | = | 1 - PR WS 01A Des. PT. C | Max. Elevation | = | 47.25 ft |
| Reservoir name | = | DESIGN POINT C STORAGE | Max. Storage | = | 740 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Report

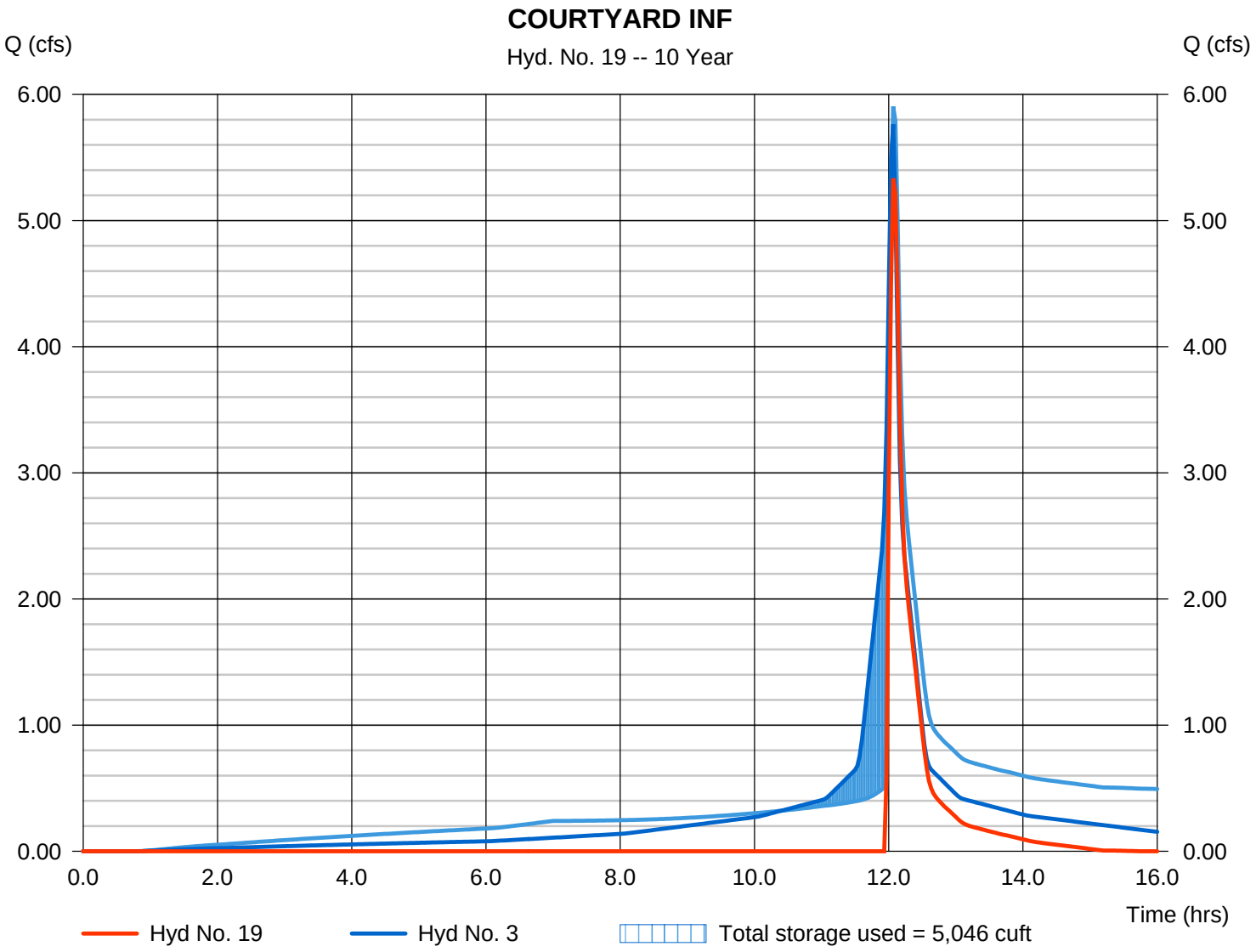
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 19

COURTYARD INF

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 5.335 cfs |
| Storm frequency | = | 10 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 6,781 cuft |
| Inflow hyd. No. | = | 3 - PR WS 03B | Max. Elevation | = | 45.88 ft |
| Reservoir name | = | Courtyard | Max. Storage | = | 5,046 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Report

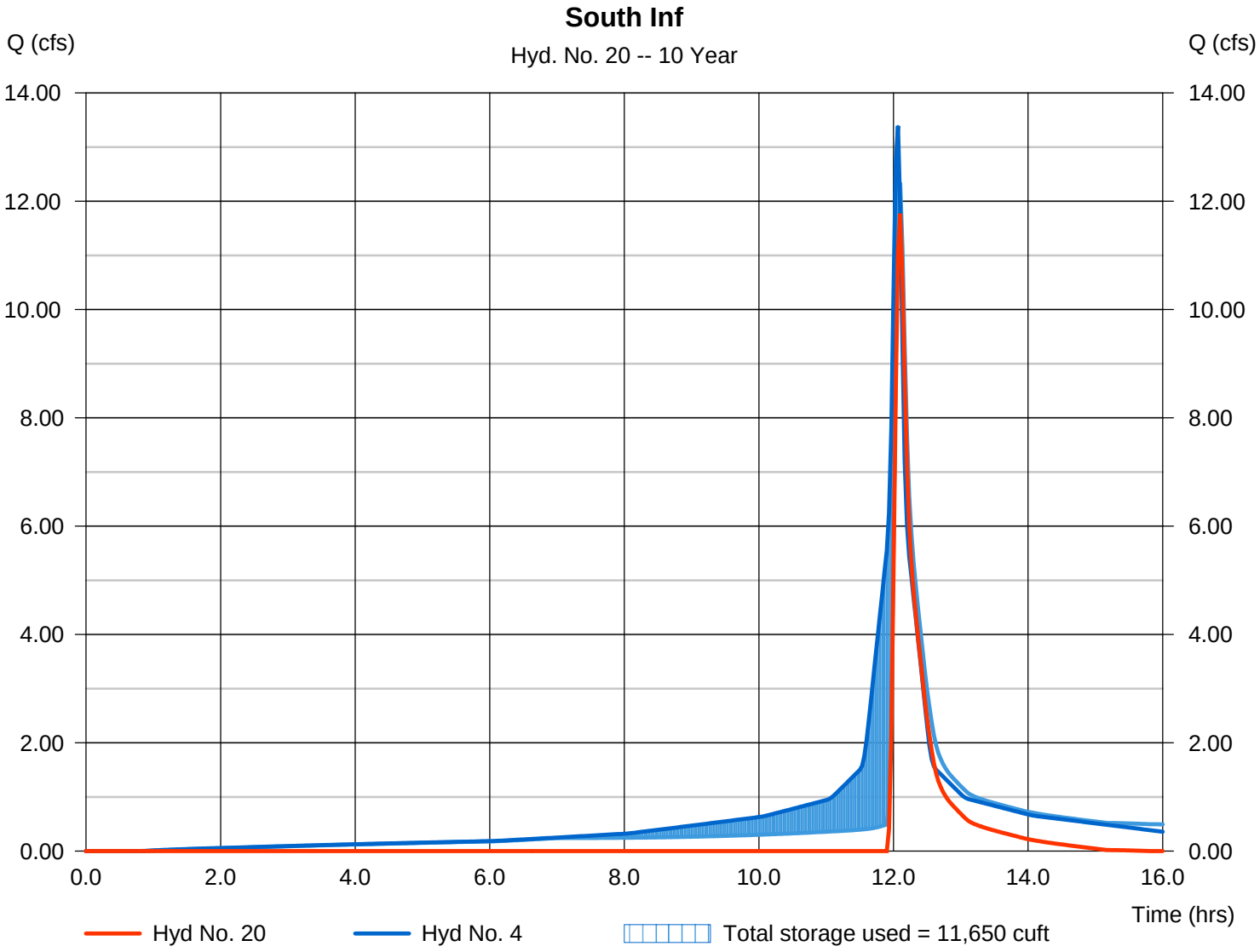
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 20

South Inf

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 11.77 cfs |
| Storm frequency | = | 10 yrs | Time to peak | = | 12.10 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 16,182 cuft |
| Inflow hyd. No. | = | 4 - PR WS 03D | Max. Elevation | = | 44.26 ft |
| Reservoir name | = | SOUTH INF | Max. Storage | = | 11,650 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



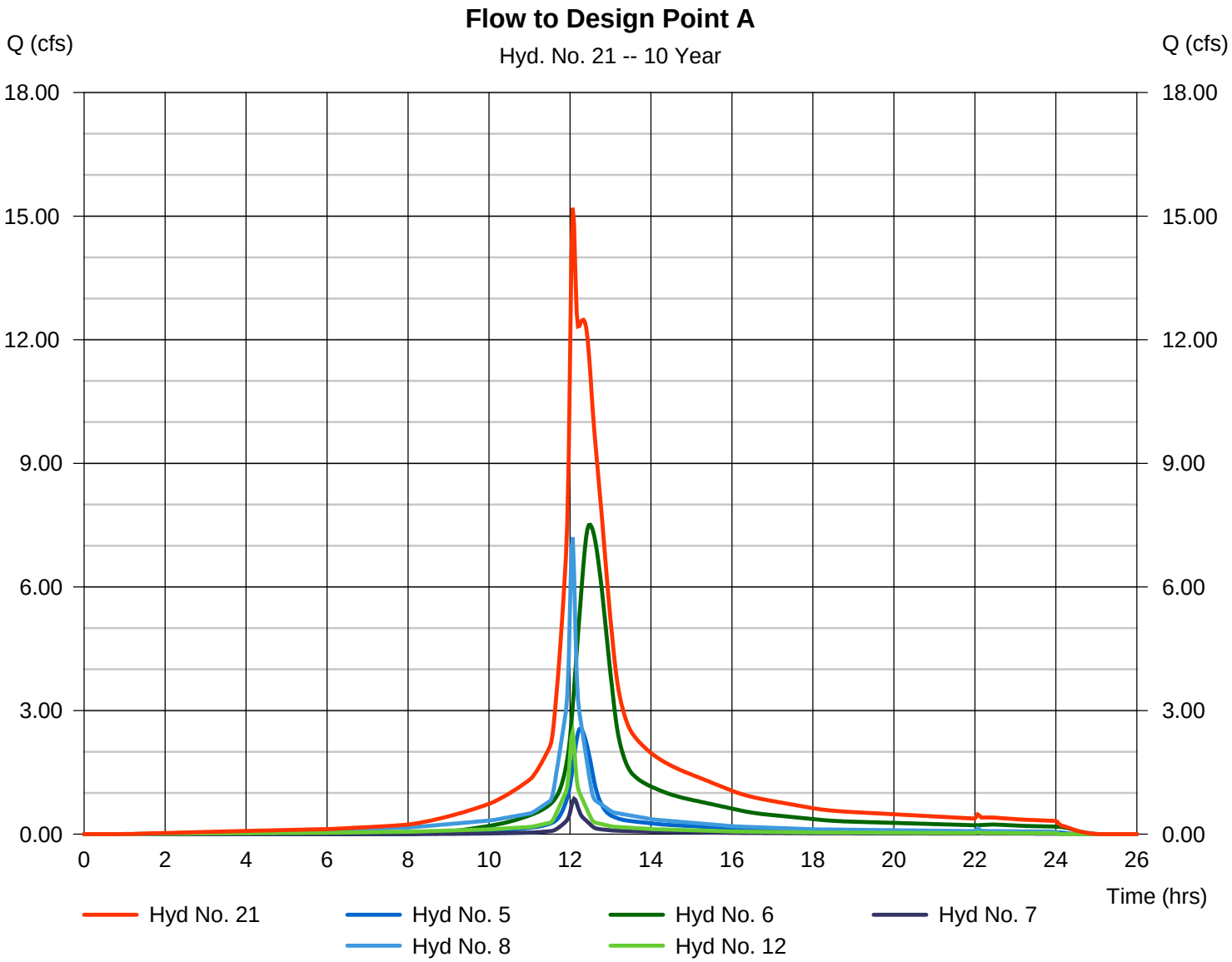
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 21

Flow to Design Point A

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 15.20 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 95,322 cuft |
| Inflow hyds. | = 5, 6, 7, 8, 12 | Contrib. drain. area | = 7.410 ac |



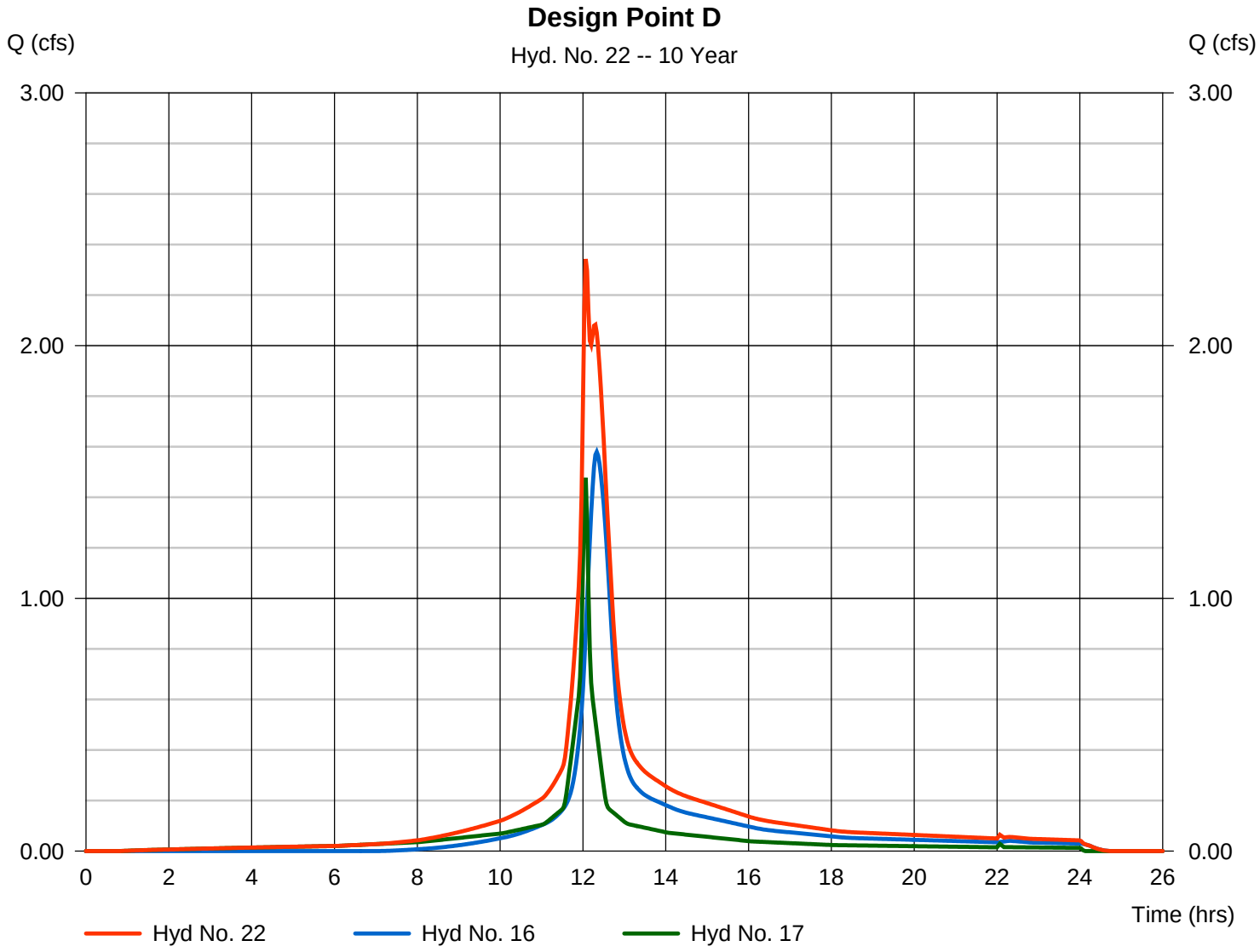
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 22

Design Point D

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 2.343 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 13,355 cuft |
| Inflow hyds. | = 16, 17 | Contrib. drain. area | = 0.971 ac |



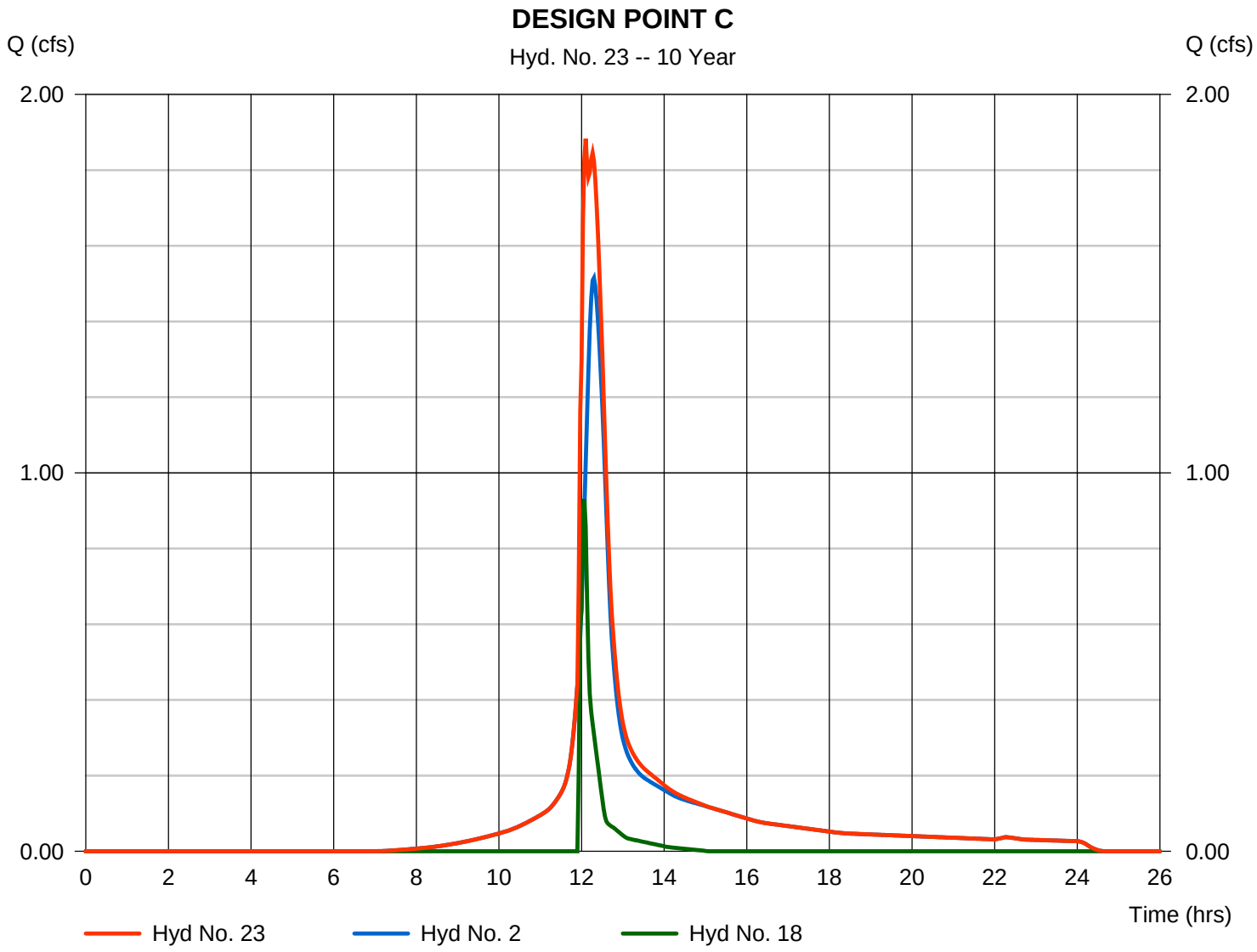
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 23

DESIGN POINT C

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 1.883 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.10 hrs |
| Time interval | = 2 min | Hyd. volume | = 8,664 cuft |
| Inflow hyds. | = 2, 18 | Contrib. drain. area | = 0.626 ac |



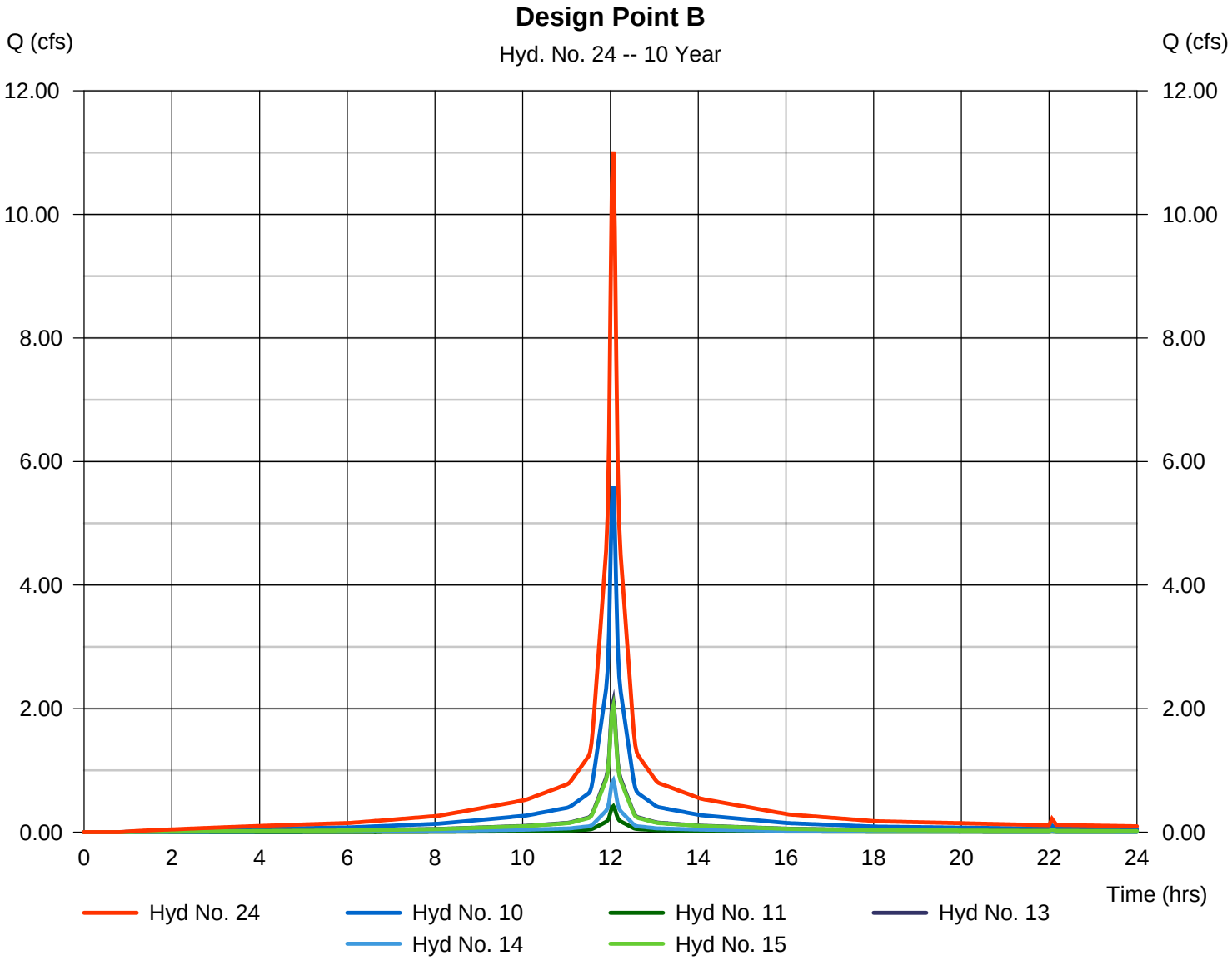
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 24

Design Point B

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 11.02 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 37,867 cuft |
| Inflow hyds. | = 10, 11, 13, 14, 15 | Contrib. drain. area | = 2.169 ac |



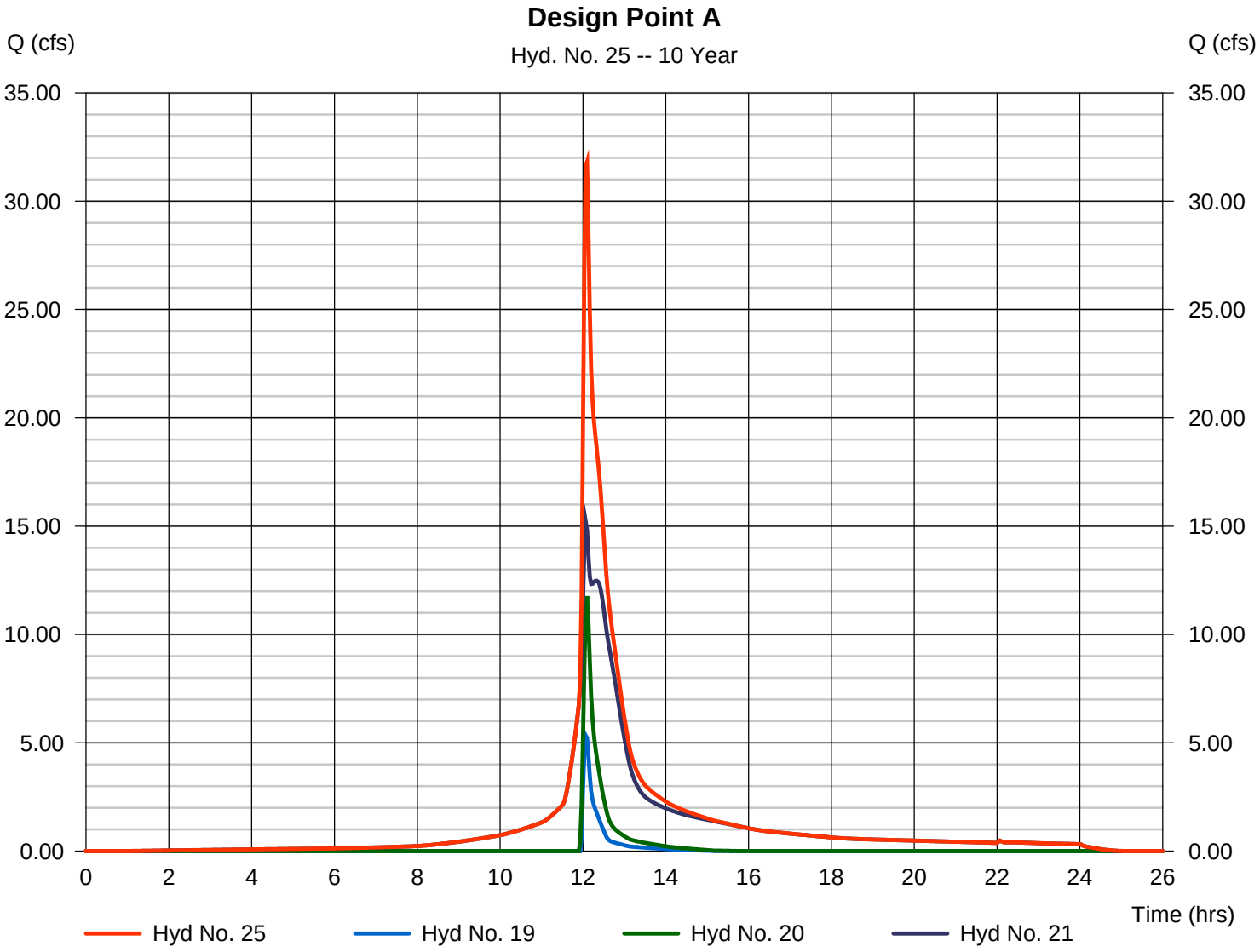
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 25

Design Point A

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 31.81 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 12.10 hrs |
| Time interval | = 2 min | Hyd. volume | = 118,286 cuft |
| Inflow hyds. | = 19, 20, 21 | Contrib. drain. area | = 0.000 ac |



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SCS Runoff | 1.189 | 2 | 724 | 4,124 | ------ | ------ | ------ | PR WS 01A Des. PT. C |
| 2 | SCS Runoff | 1.978 | 2 | 738 | 9,816 | ------ | ------ | ------ | PR WS 01 Des. PT. C |
| 3 | SCS Runoff | 7.001 | 2 | 724 | 24,292 | ------ | ------ | ------ | PR WS 03B |
| 4 | SCS Runoff | 16.27 | 2 | 724 | 56,445 | ------ | ------ | ------ | PR WS 03D |
| 5 | SCS Runoff | 3.367 | 2 | 736 | 16,023 | ------ | ------ | ------ | PR WS 03A |
| 6 | SCS Runoff | 9.991 | 2 | 748 | 63,001 | ------ | ------ | ------ | OFFSITE 01 |
| 7 | SCS Runoff | 1.139 | 2 | 726 | 3,899 | ------ | ------ | ------ | OFFSITE 02 |
| 8 | SCS Runoff | 8.772 | 2 | 724 | 29,990 | ------ | ------ | ------ | PR WS 03C |
| 9 | SCS Runoff | 1.312 | 2 | 724 | 4,553 | ------ | ------ | ------ | PR WS 09 |
| 10 | SCS Runoff | 6.797 | 2 | 724 | 23,583 | ------ | ------ | ------ | PR WS 06 |
| 11 | SCS Runoff | 0.520 | 2 | 724 | 1,665 | ------ | ------ | ------ | PR WS 08 |
| 12 | SCS Runoff | 3.002 | 2 | 724 | 10,417 | ------ | ------ | ------ | PR WS 05 |
| 13 | SCS Runoff | 2.581 | 2 | 724 | 8,956 | ------ | ------ | ------ | PR WS 02 |
| 14 | SCS Runoff | 1.015 | 2 | 724 | 3,522 | ------ | ------ | ------ | PR WS 02A |
| 15 | SCS Runoff | 2.482 | 2 | 724 | 8,613 | ------ | ------ | ------ | PR WS 07 |
| 16 | SCS Runoff | 2.064 | 2 | 740 | 10,848 | ------ | ------ | ------ | PR WS 04 |
| 17 | SCS Runoff | 1.795 | 2 | 724 | 6,229 | ------ | ------ | ------ | PR WS 04A |
| 18 | Reservoir | 1.153 | 2 | 724 | 1,755 | 1 | 47.27 | 744 | Design Point C Storage |
| 19 | Reservoir | 6.573 | 2 | 724 | 10,138 | 3 | 45.95 | 5,127 | COURTYARD INF |
| 20 | Reservoir | 14.67 | 2 | 726 | 23,815 | 4 | 44.38 | 11,953 | South Inf |
| 21 | Combine | 19.30 | 2 | 724 | 123,331 | 5, 6, 7, 8, 12, | ------ | ------ | Flow to Design Point A |
| 22 | Combine | 2.953 | 2 | 724 | 17,076 | 16, 17, | ------ | ------ | Design Point D |
| 23 | Combine | 2.403 | 2 | 726 | 11,570 | 2, 18, | ------ | ------ | DESIGN POINT C |
| 24 | Combine | 13.40 | 2 | 724 | 46,339 | 10, 11, 13, 14, 15, | ------ | ------ | Design Point B |
| 25 | Combine | 40.28 | 2 | 724 | 157,283 | 19, 20, 21, | ------ | ------ | Design Point A |

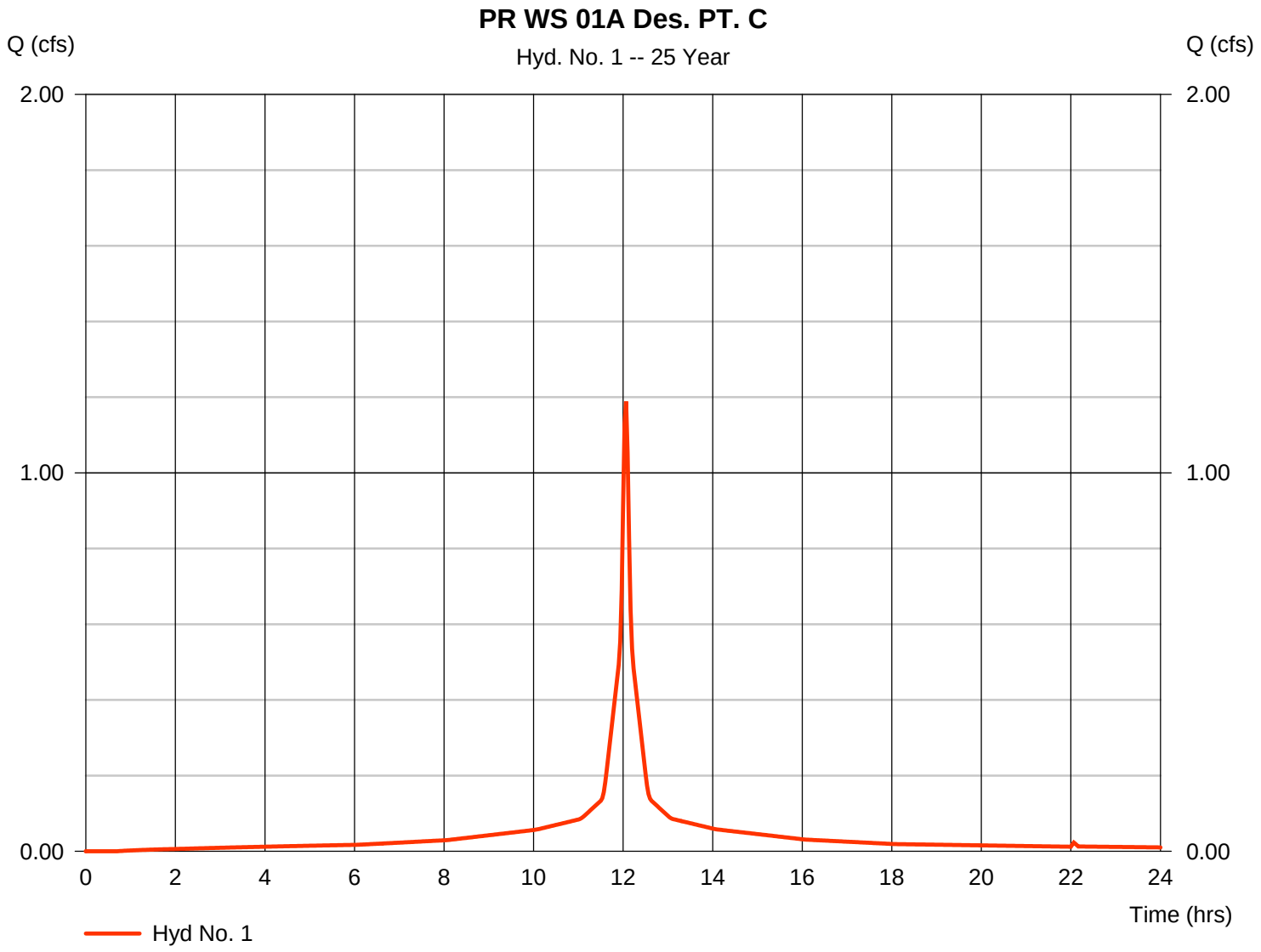
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 1

PR WS 01A Des. PT. C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.189 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 4,124 cuft |
| Drainage area | = 0.192 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



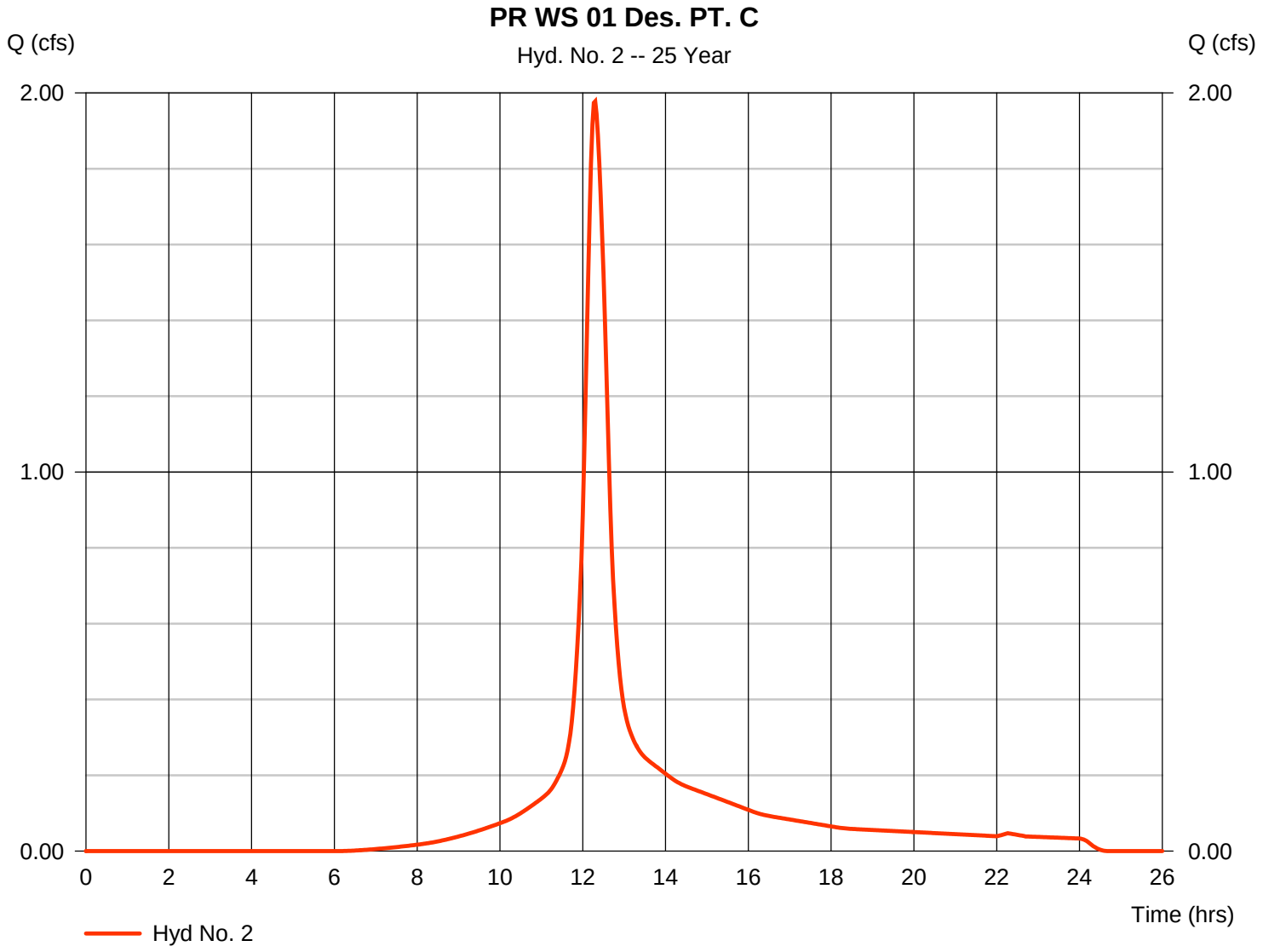
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 2

PR WS 01 Des. PT. C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.978 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.30 hrs |
| Time interval | = 2 min | Hyd. volume | = 9,816 cuft |
| Drainage area | = 0.626 ac | Curve number | = 81 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 25.80 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



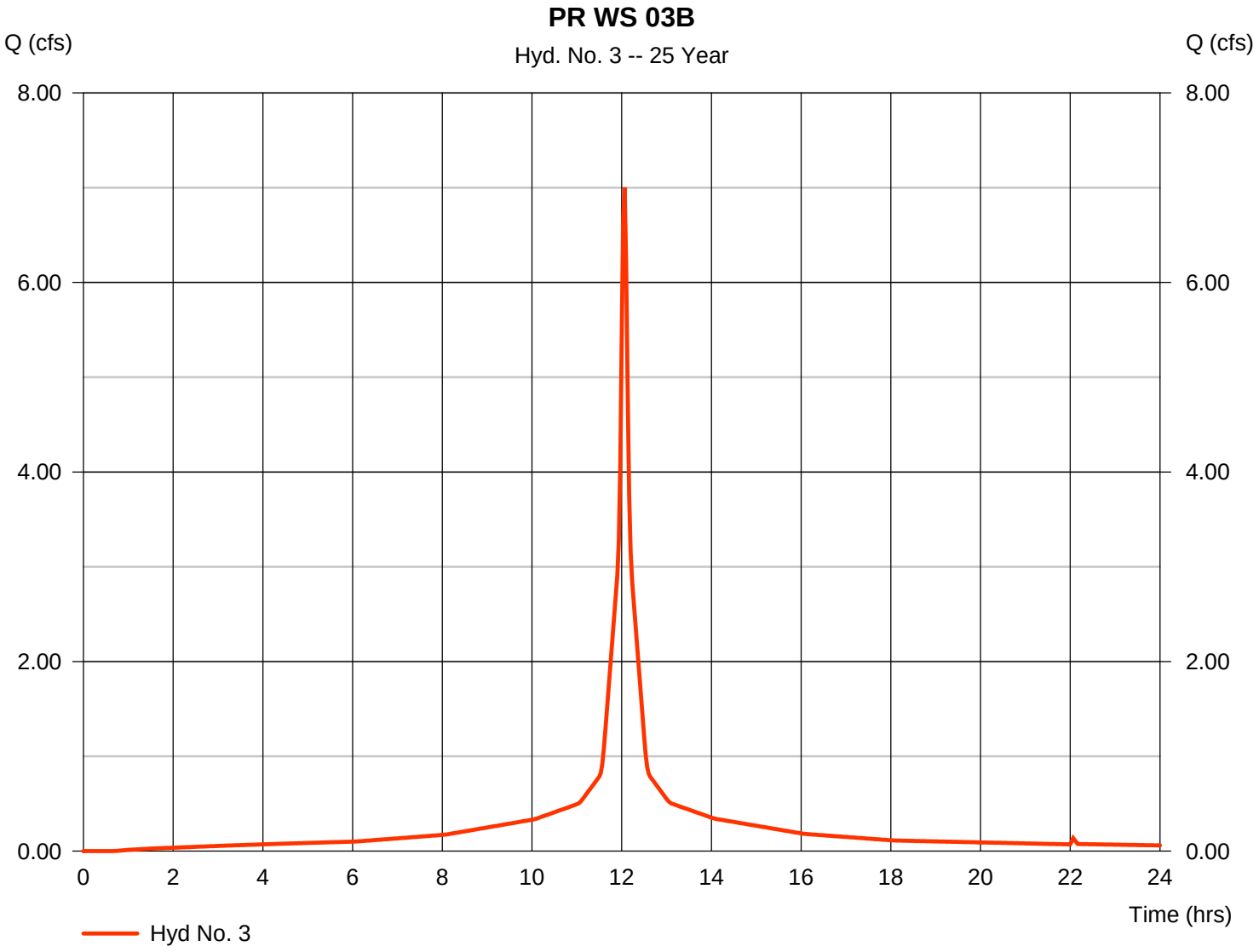
# Hydrograph Report



## Hyd. No. 3

PR WS 03B

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 7.001 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 24,292 cuft |
| Drainage area | = | 1.131 ac | Curve number | = | 98 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 6.55 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



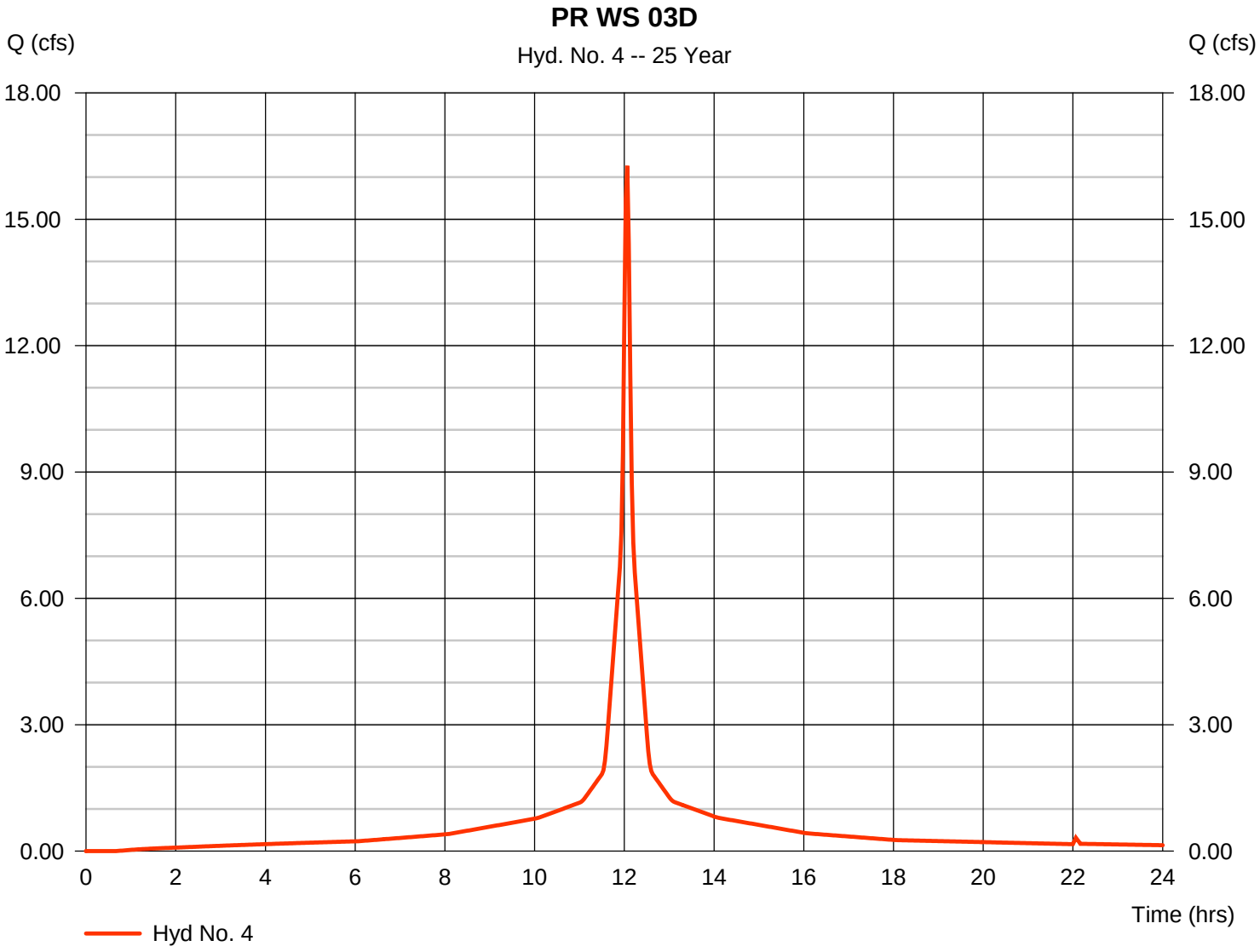
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 4

PR WS 03D

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 16.27 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 56,445 cuft |
| Drainage area | = 2.628 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



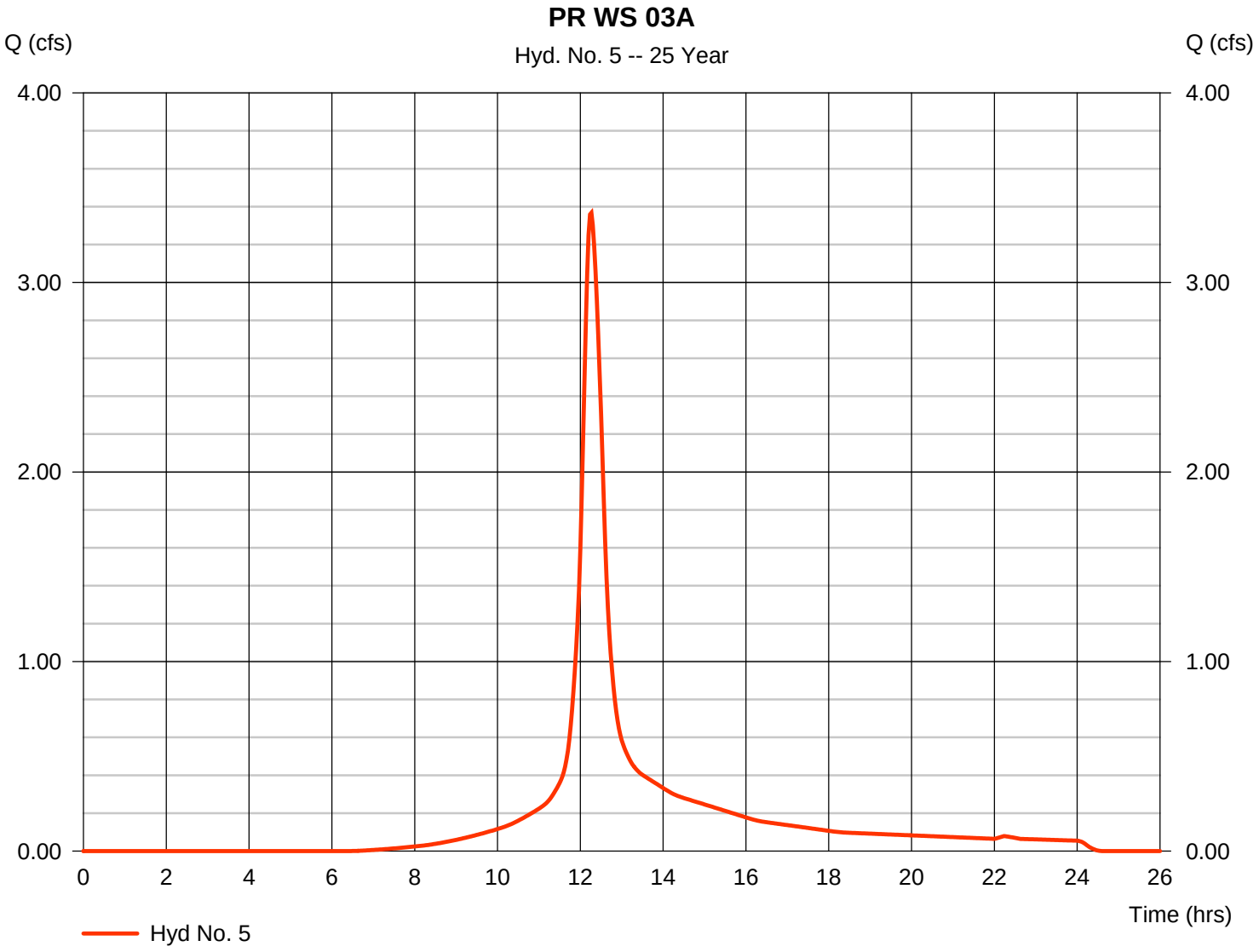
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 5

PR WS 03A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 3.367 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.27 hrs |
| Time interval | = 2 min | Hyd. volume | = 16,023 cuft |
| Drainage area | = 1.013 ac | Curve number | = 80 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 20.70 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



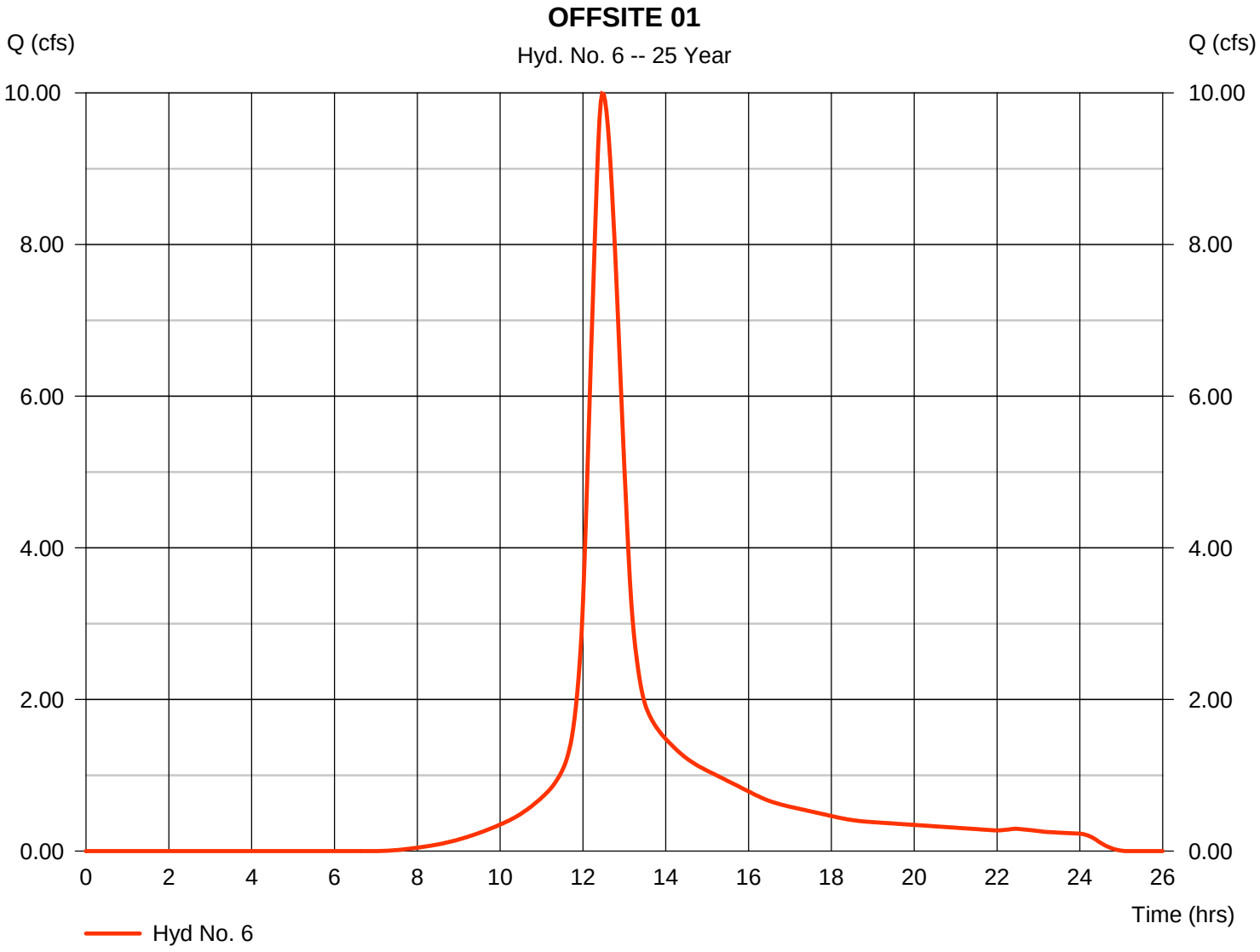
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 6

OFFSITE 01

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 9.991 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.47 hrs |
| Time interval | = 2 min | Hyd. volume | = 63,001 cuft |
| Drainage area | = 4.225 ac | Curve number | = 78 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 41.40 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



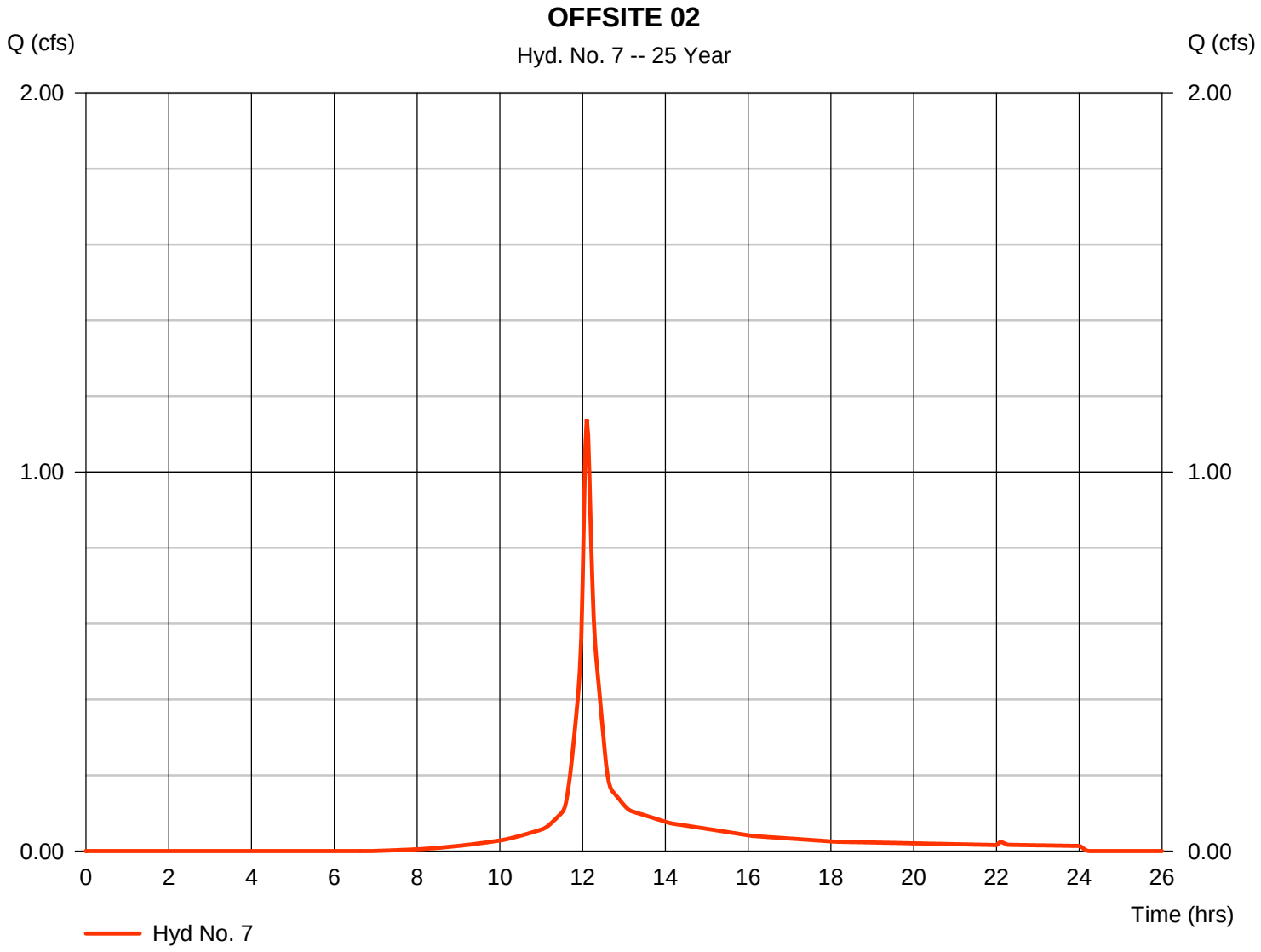
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 7

OFFSITE 02

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.139 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.10 hrs |
| Time interval | = 2 min | Hyd. volume | = 3,899 cuft |
| Drainage area | = 0.264 ac | Curve number | = 78 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 7.10 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



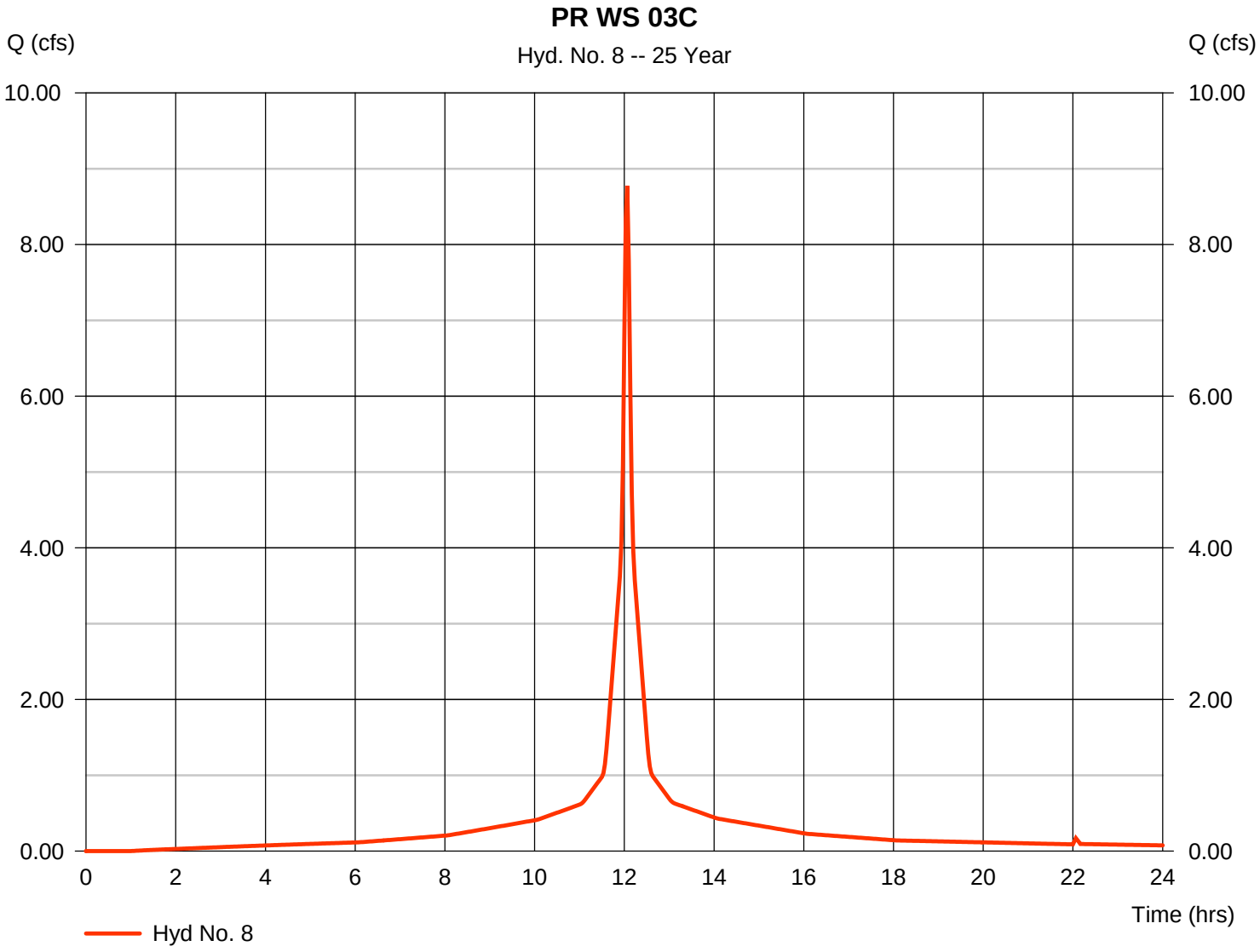
# Hydrograph Report



## Hyd. No. 8

PR WS 03C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 8.772 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 29,990 cuft |
| Drainage area | = 1.423 ac | Curve number | = 97 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



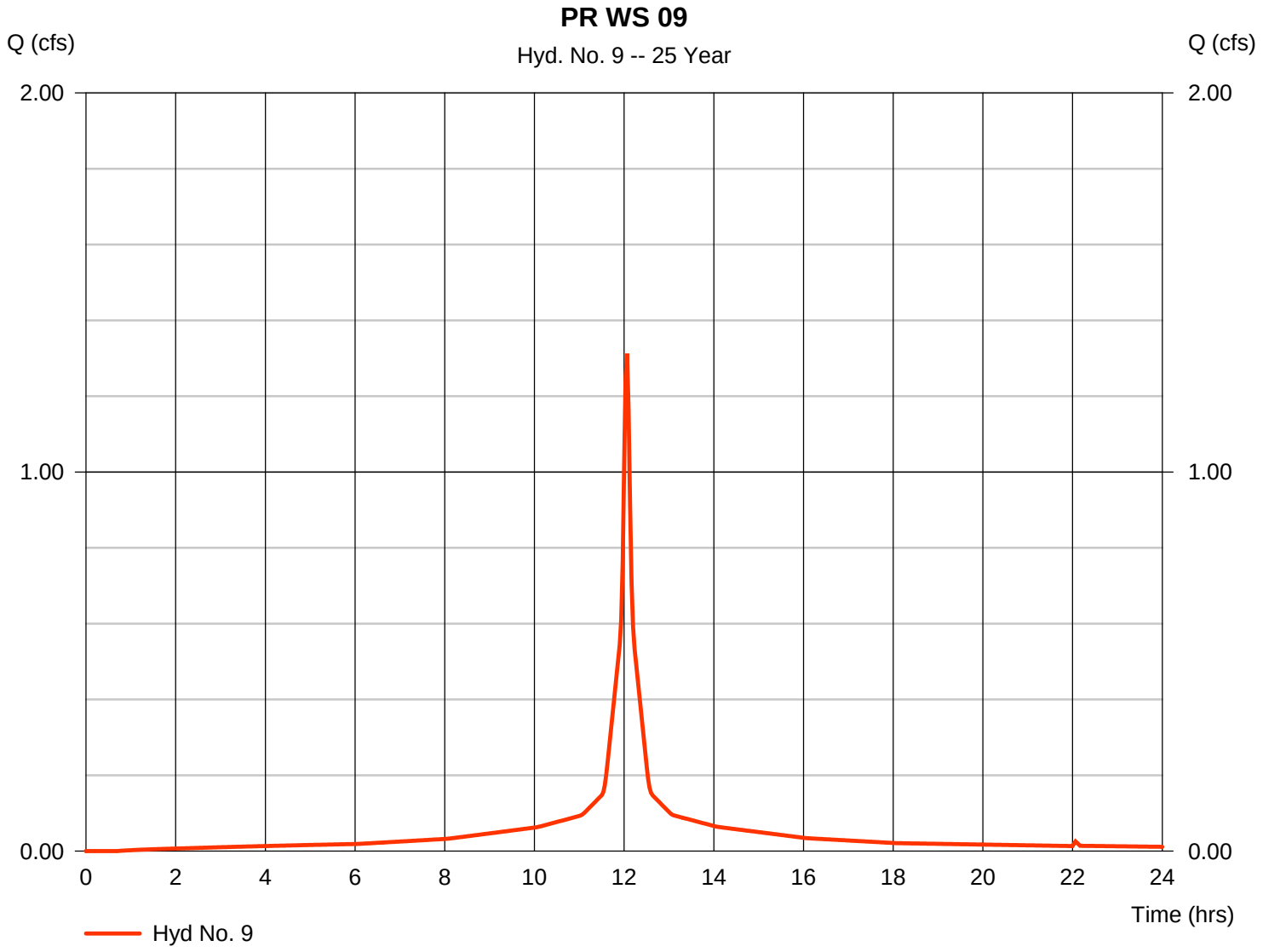
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 9

PR WS 09

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.312 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 4,553 cuft |
| Drainage area | = 0.212 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



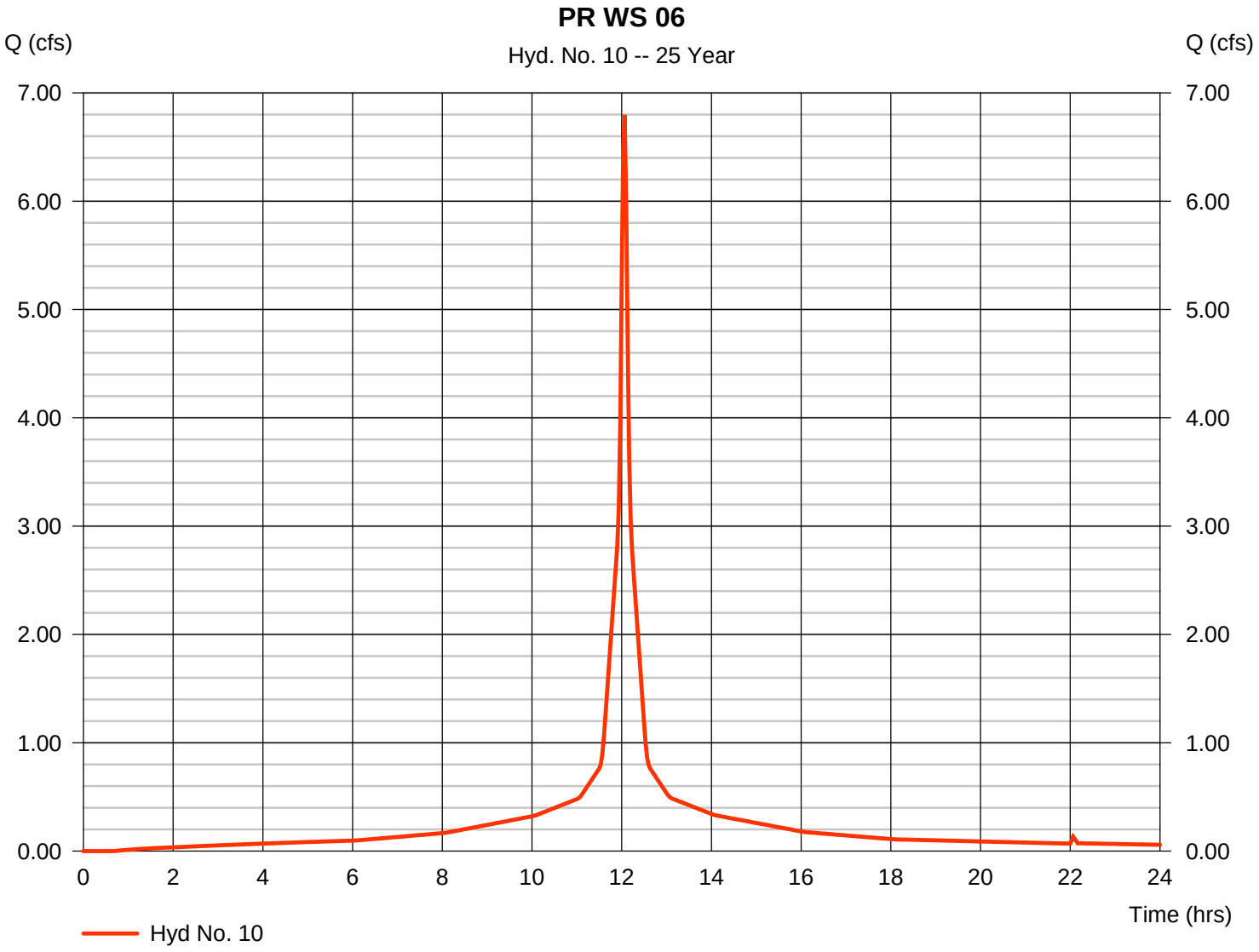
# Hydrograph Report



## Hyd. No. 10

PR WS 06

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 6.797 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 23,583 cuft |
| Drainage area | = 1.098 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



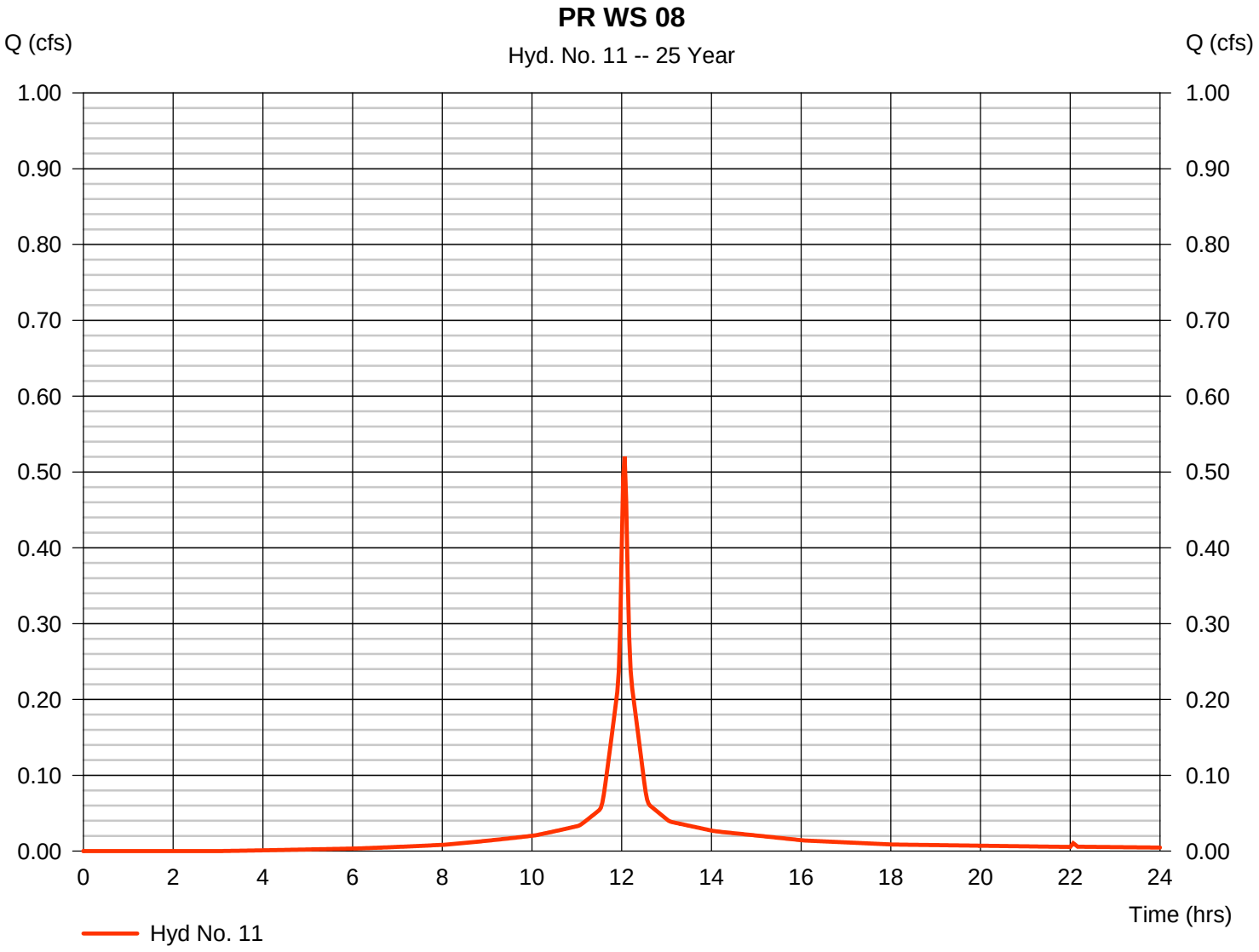
# Hydrograph Report



## Hyd. No. 11

PR WS 08

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.520 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 1,665 cuft |
| Drainage area | = 0.089 ac | Curve number | = 91 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



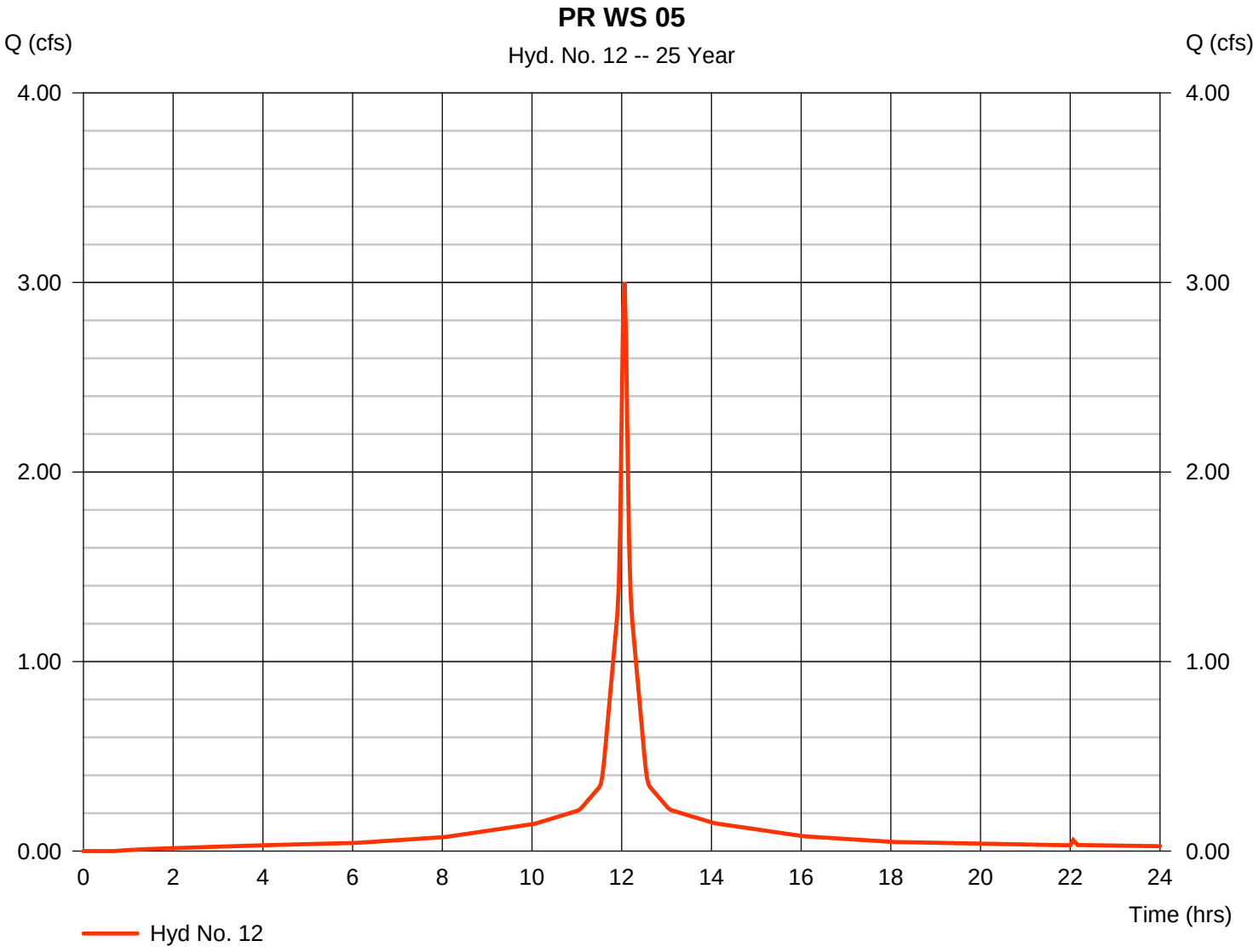
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 12

PR WS 05

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 3.002 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 10,417 cuft |
| Drainage area | = 0.485 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



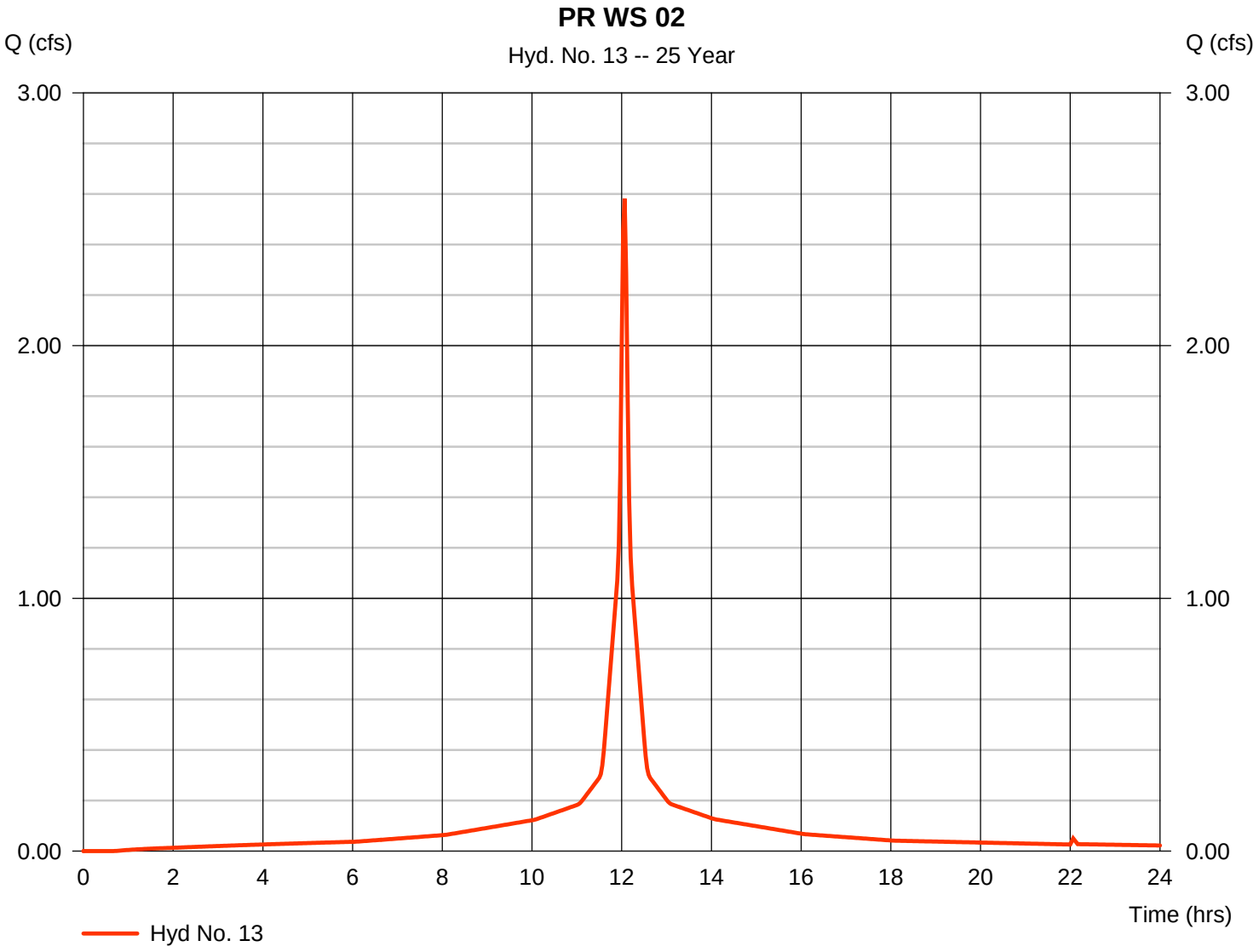
# Hydrograph Report



## Hyd. No. 13

PR WS 02

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 2.581 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 8,956 cuft |
| Drainage area | = | 0.417 ac | Curve number | = | 98 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 6.55 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



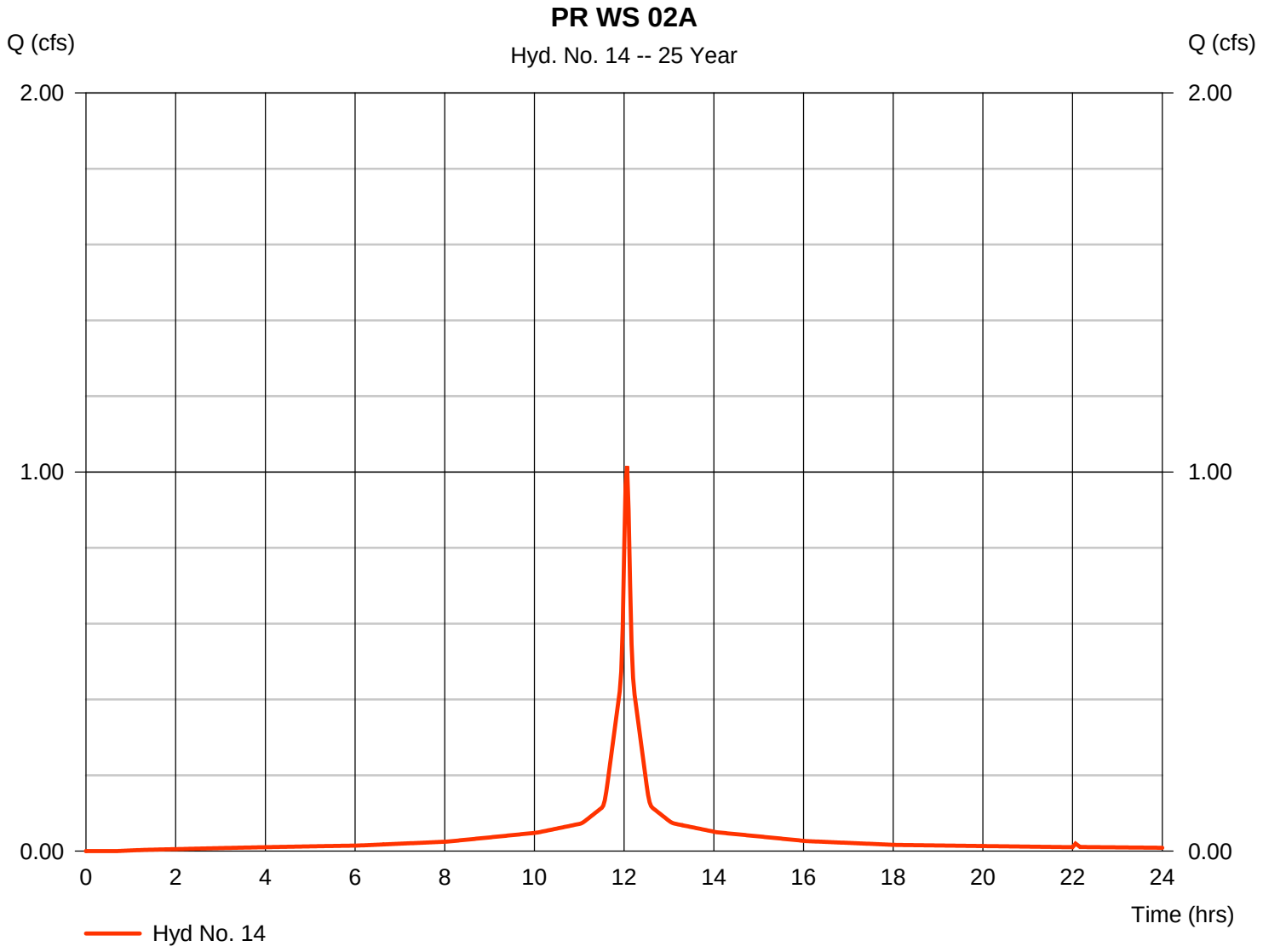
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 14

PR WS 02A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.015 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 3,522 cuft |
| Drainage area | = 0.164 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



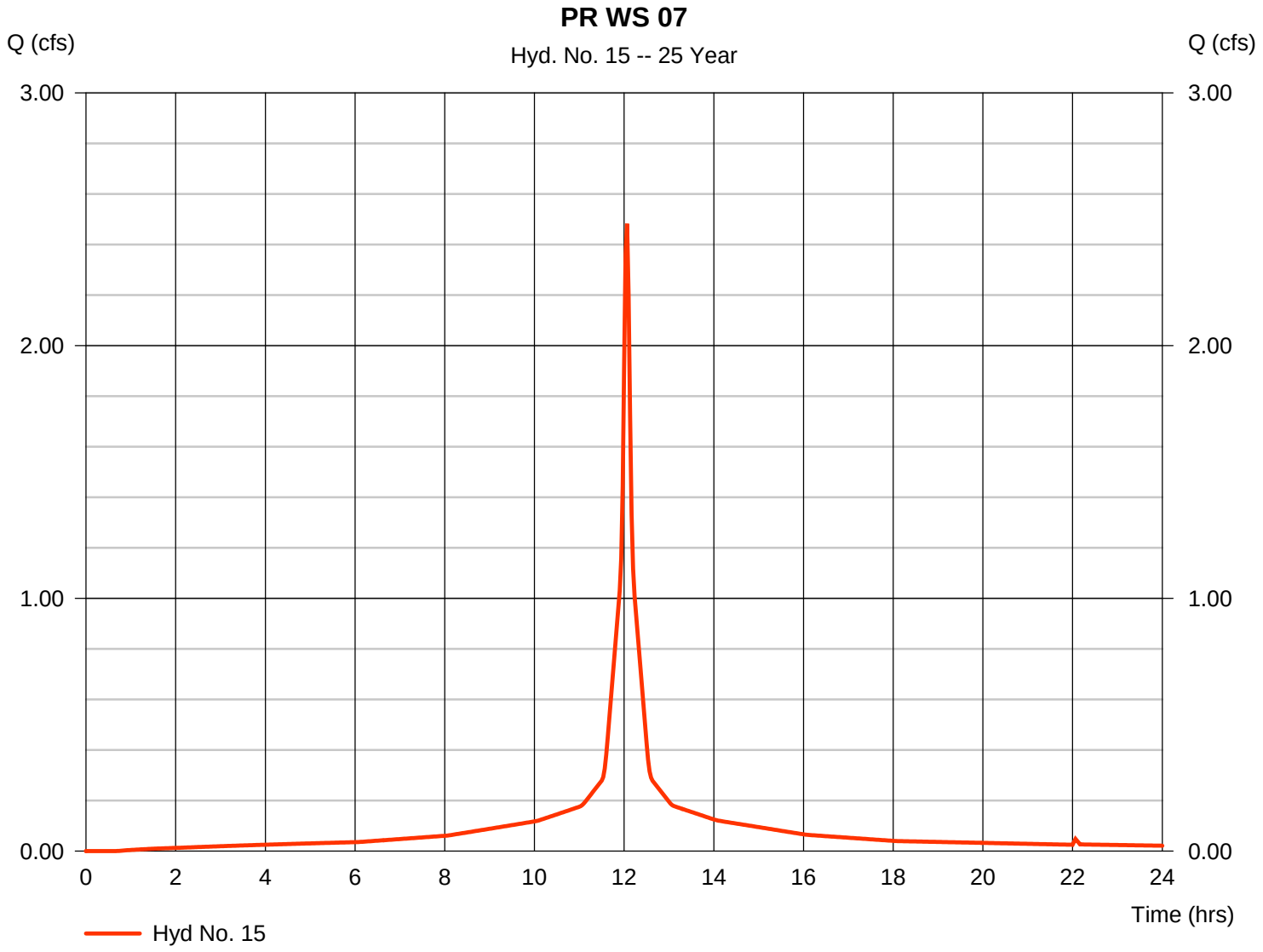
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 15

PR WS 07

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 2.482 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 8,613 cuft |
| Drainage area | = | 0.401 ac | Curve number | = | 98 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 6.55 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



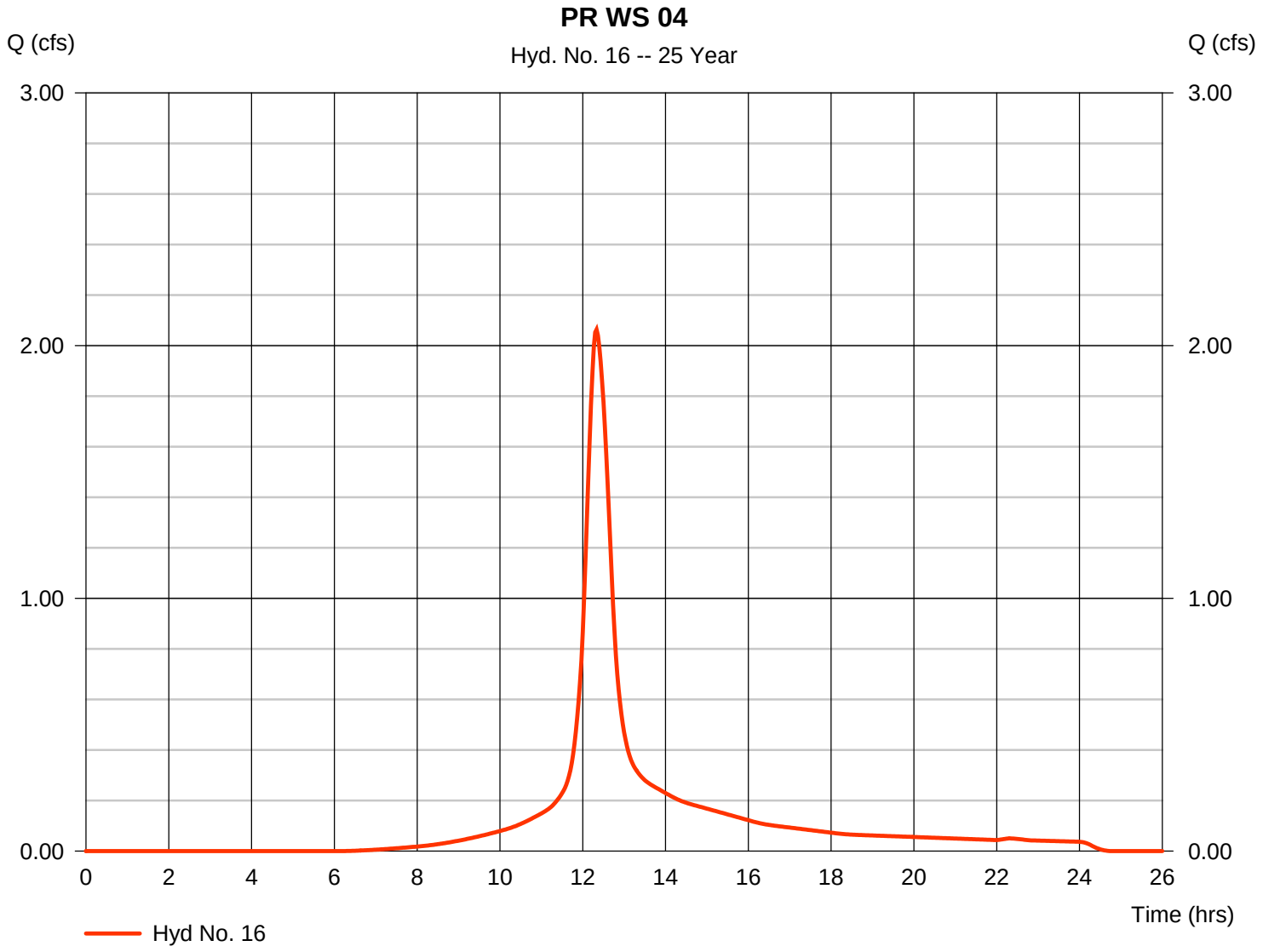
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 16

PR WS 04

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.064 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.33 hrs |
| Time interval | = 2 min | Hyd. volume | = 10,848 cuft |
| Drainage area | = 0.681 ac | Curve number | = 81 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 29.80 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



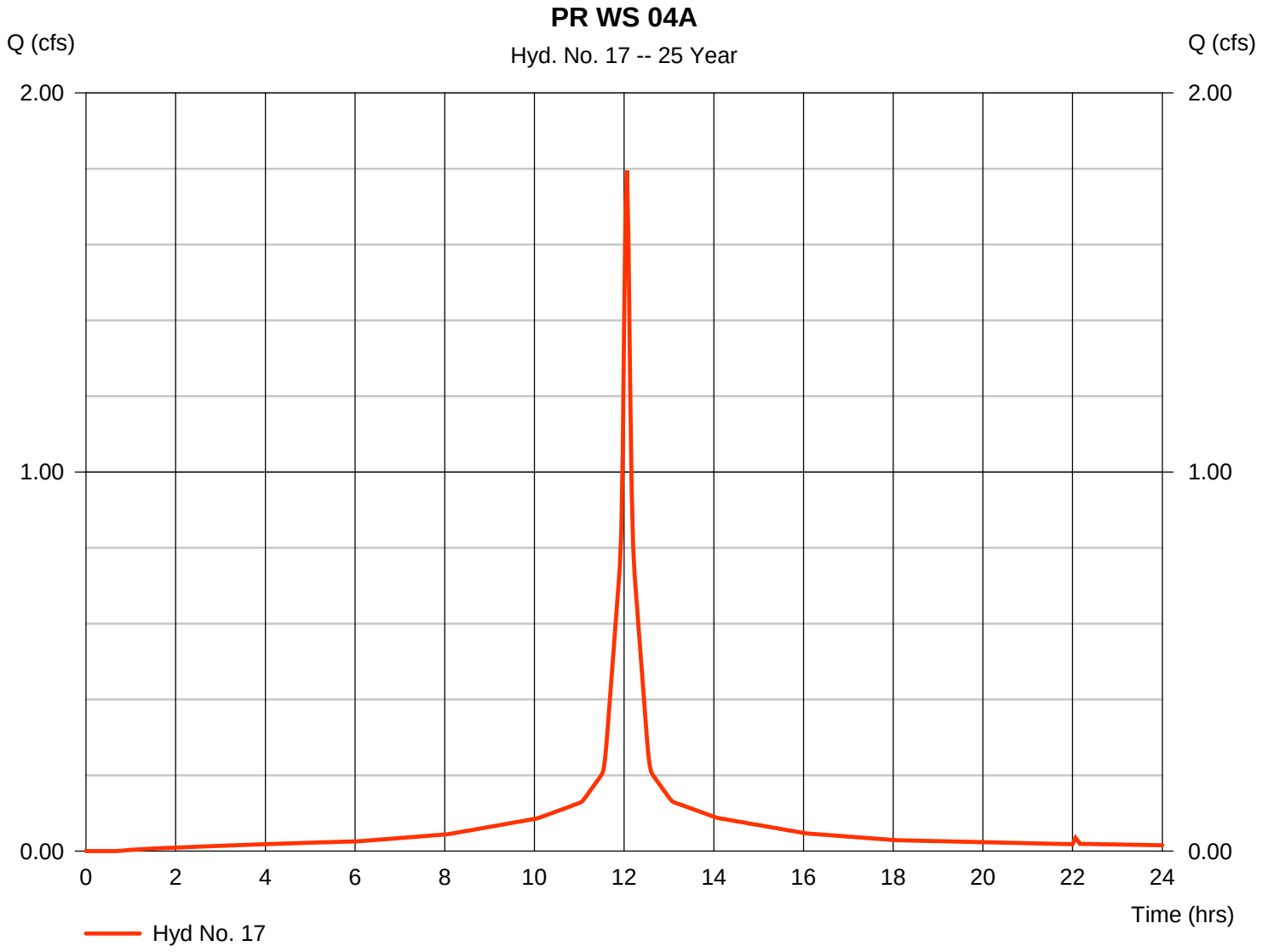
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 17

PR WS 04A

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 1.795 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 6,229 cuft |
| Drainage area | = | 0.290 ac | Curve number | = | 98 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 6.55 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



# Hydrograph Report

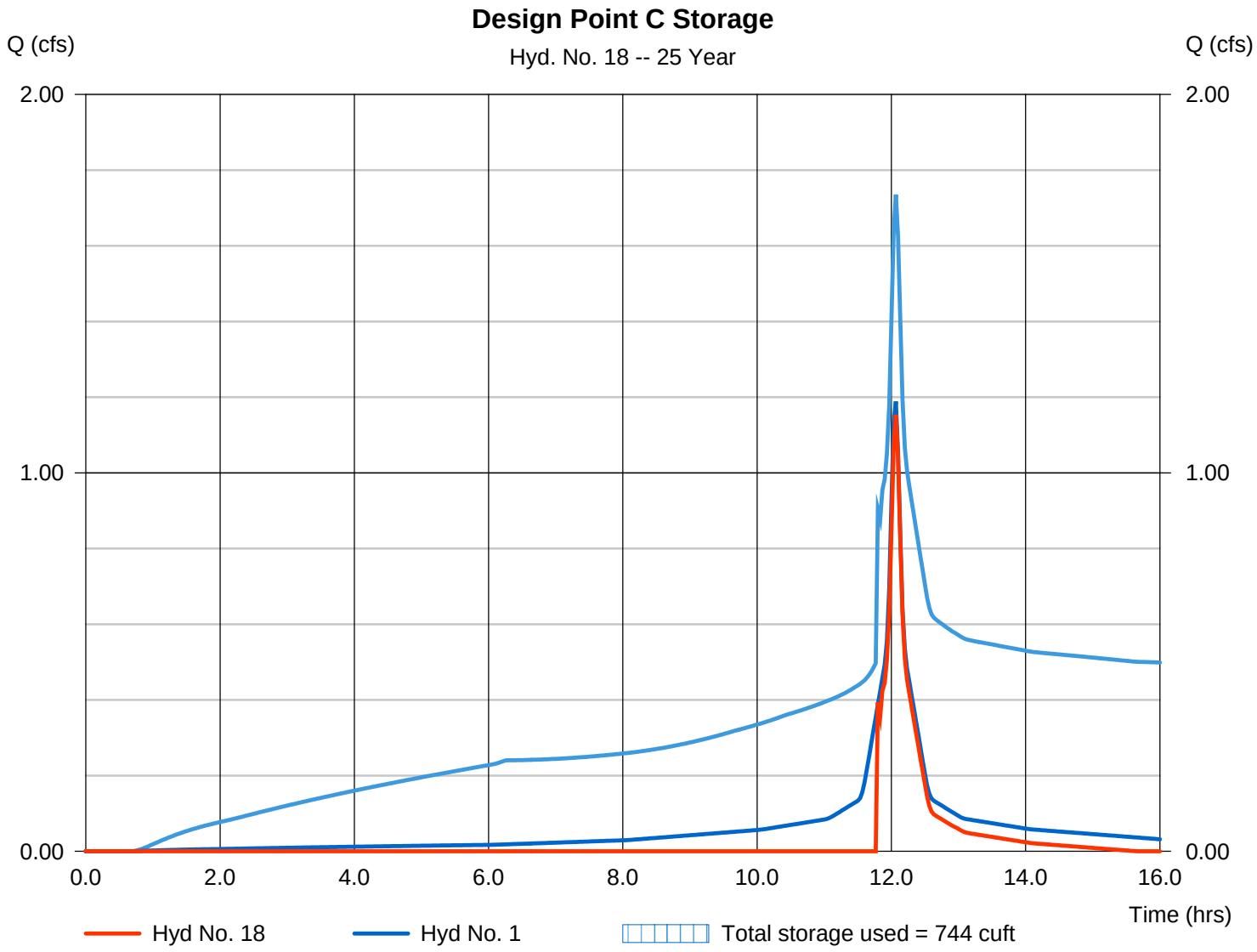
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 18

Design Point C Storage

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 1.153 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 1,755 cuft |
| Inflow hyd. No. | = | 1 - PR WS 01A Des. PT. C | Max. Elevation | = | 47.27 ft |
| Reservoir name | = | DESIGN POINT C STORAGE | Max. Storage | = | 744 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Report

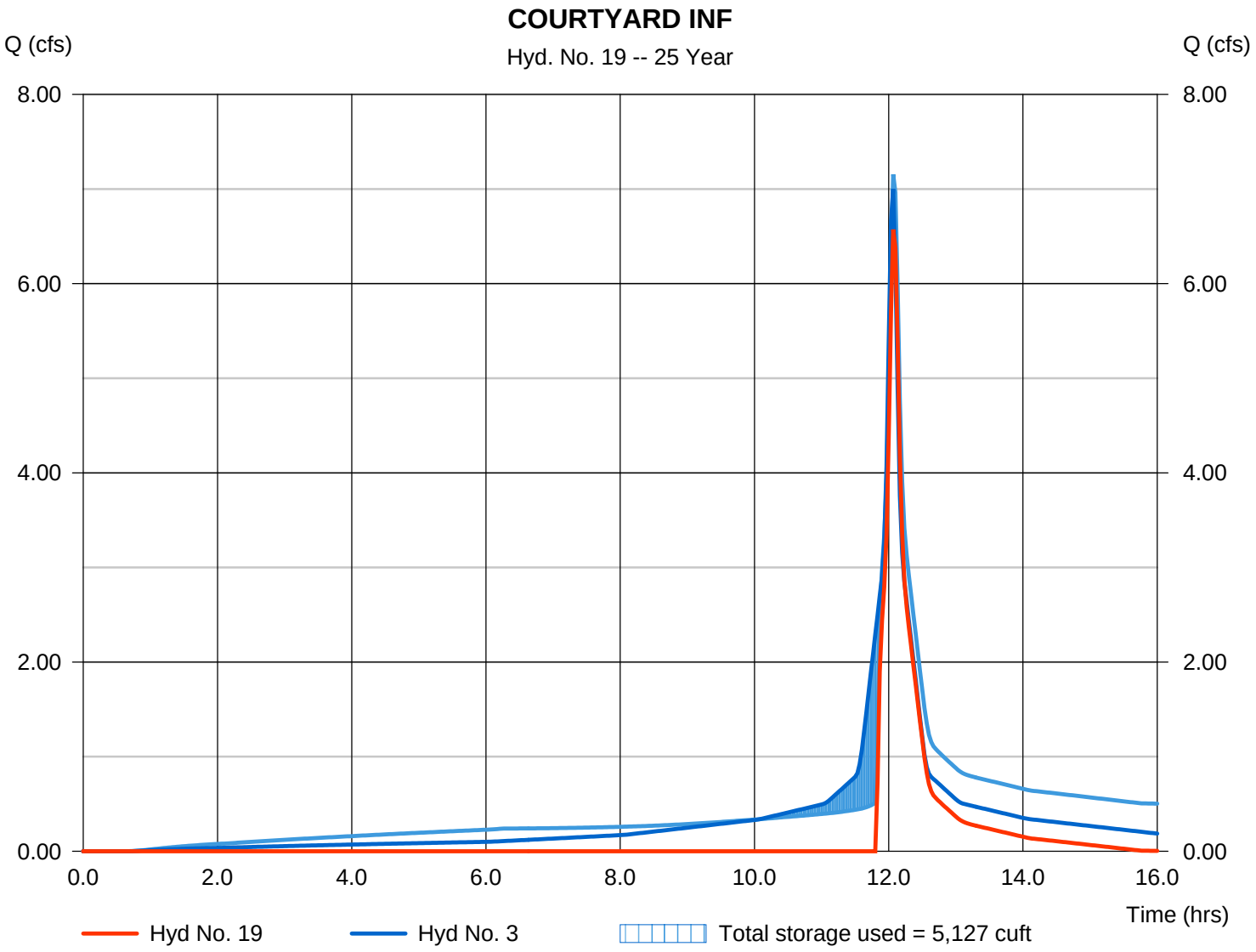
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 19

COURTYARD INF

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 6.573 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 10,138 cuft |
| Inflow hyd. No. | = | 3 - PR WS 03B | Max. Elevation | = | 45.95 ft |
| Reservoir name | = | Courtyard | Max. Storage | = | 5,127 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Report

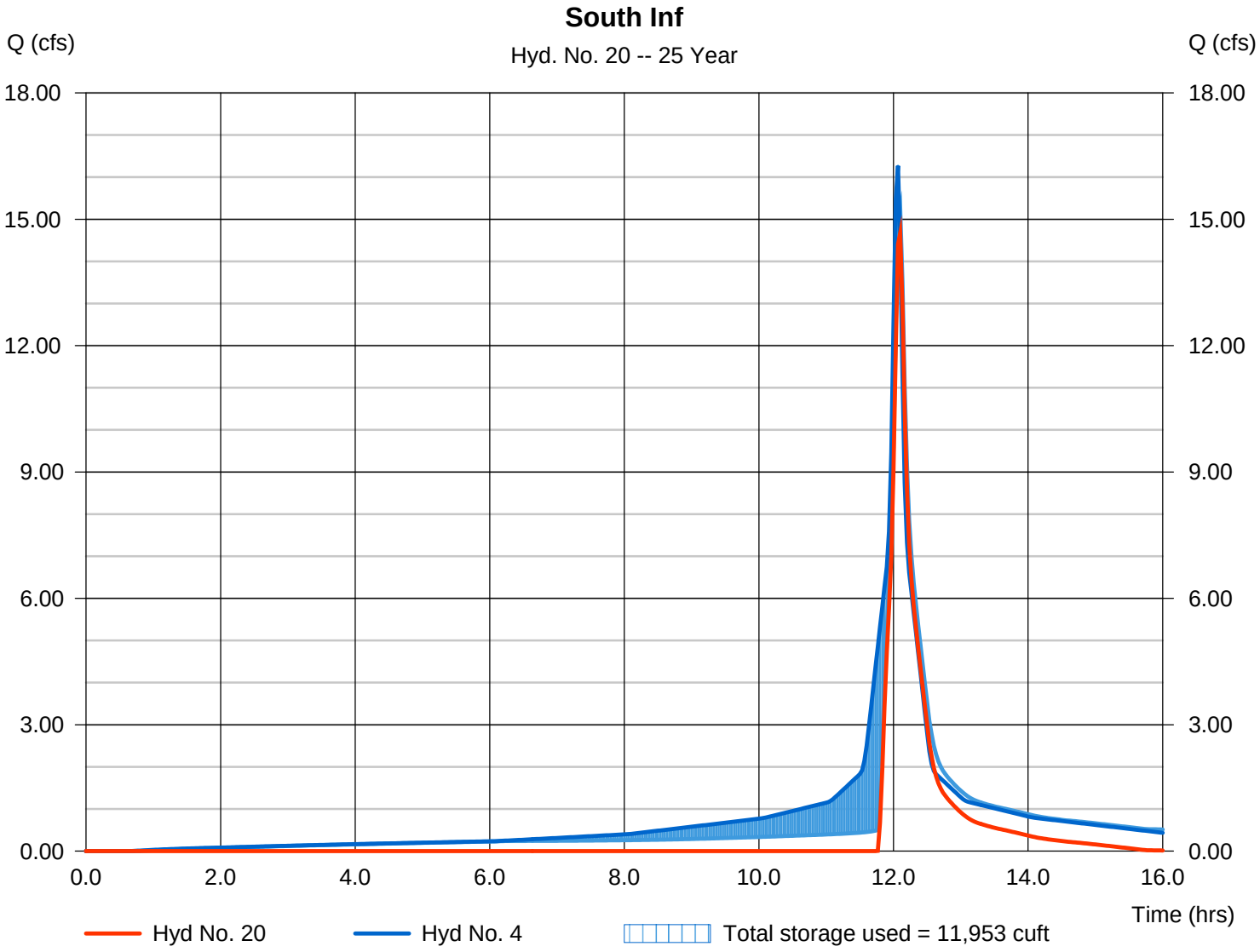
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 20

South Inf

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 14.67 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 12.10 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 23,815 cuft |
| Inflow hyd. No. | = | 4 - PR WS 03D | Max. Elevation | = | 44.38 ft |
| Reservoir name | = | SOUTH INF | Max. Storage | = | 11,953 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



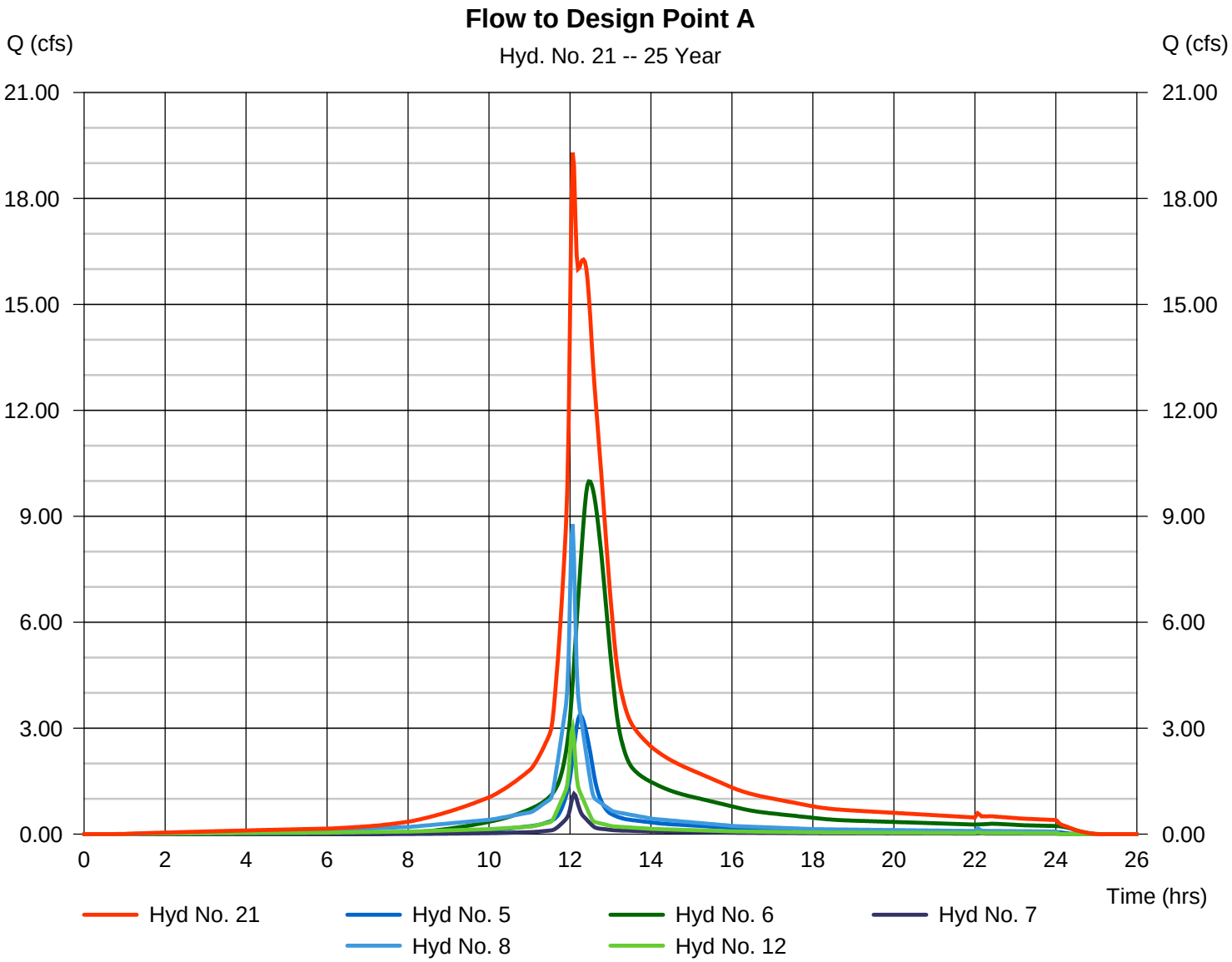
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 21

Flow to Design Point A

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 19.30 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 123,331 cuft |
| Inflow hyds. | = 5, 6, 7, 8, 12 | Contrib. drain. area | = 7.410 ac |



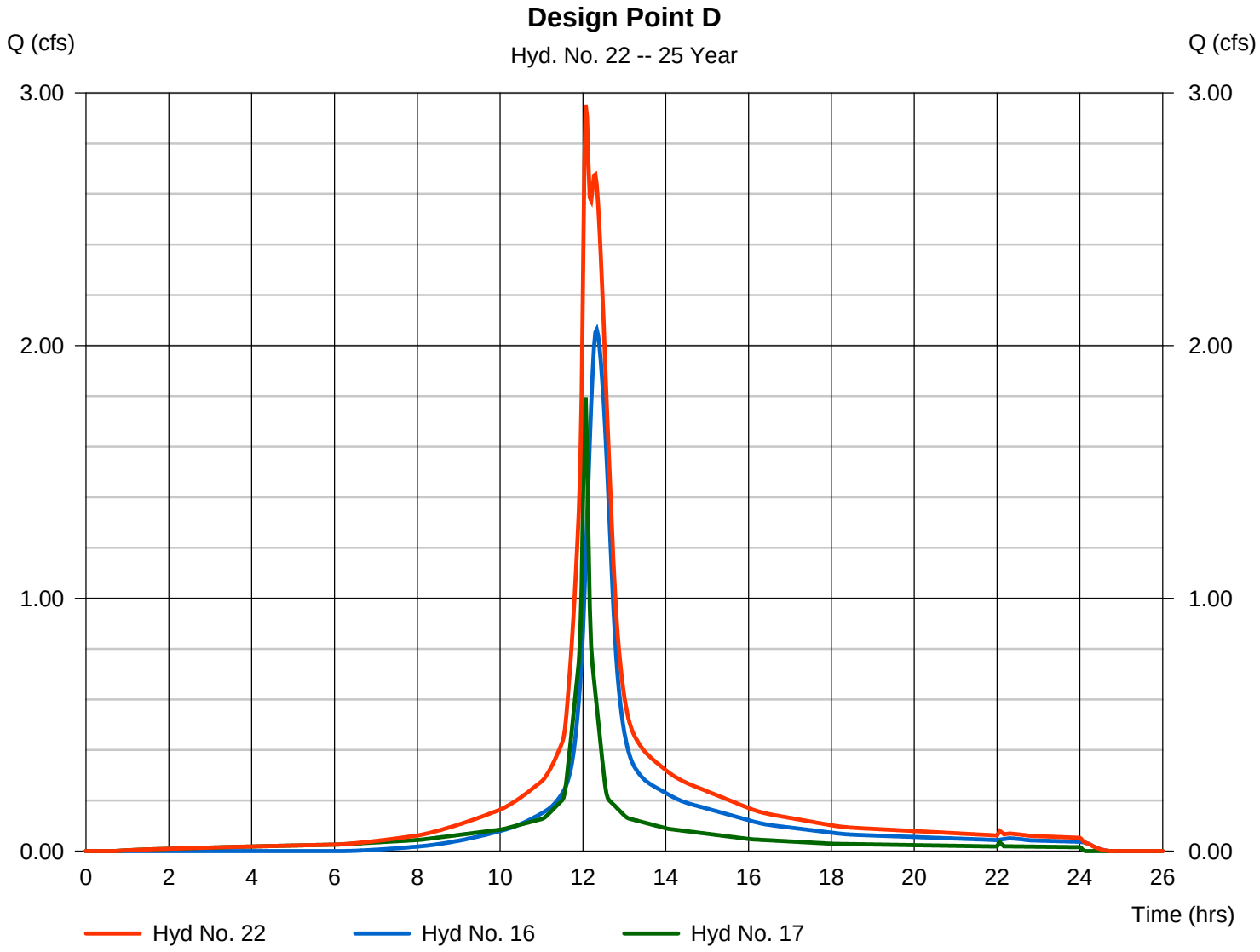
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 22

Design Point D

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 2.953 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 17,076 cuft |
| Inflow hyds. | = 16, 17 | Contrib. drain. area | = 0.971 ac |



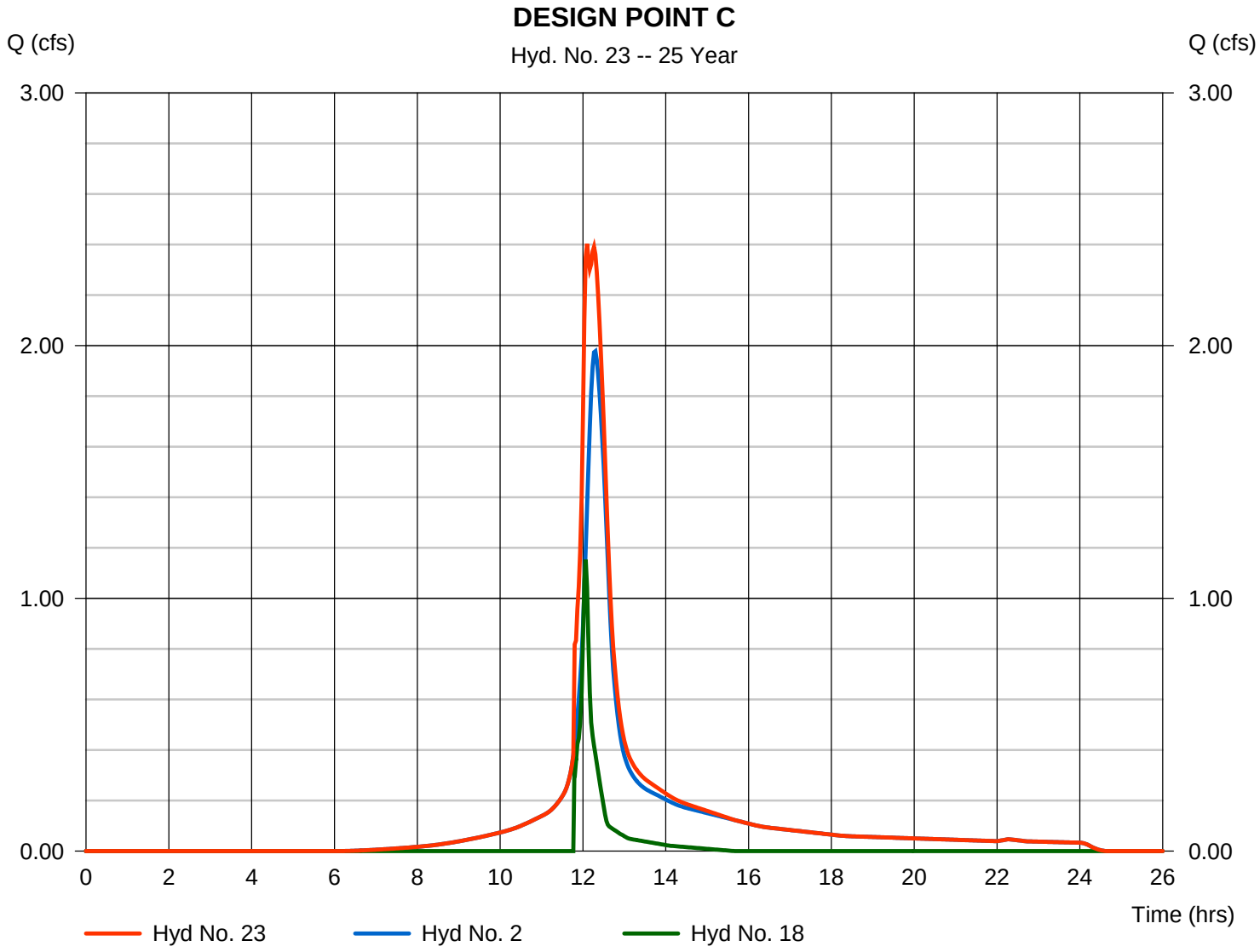
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 23

DESIGN POINT C

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 2.403 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.10 hrs |
| Time interval | = 2 min | Hyd. volume | = 11,570 cuft |
| Inflow hyds. | = 2, 18 | Contrib. drain. area | = 0.626 ac |



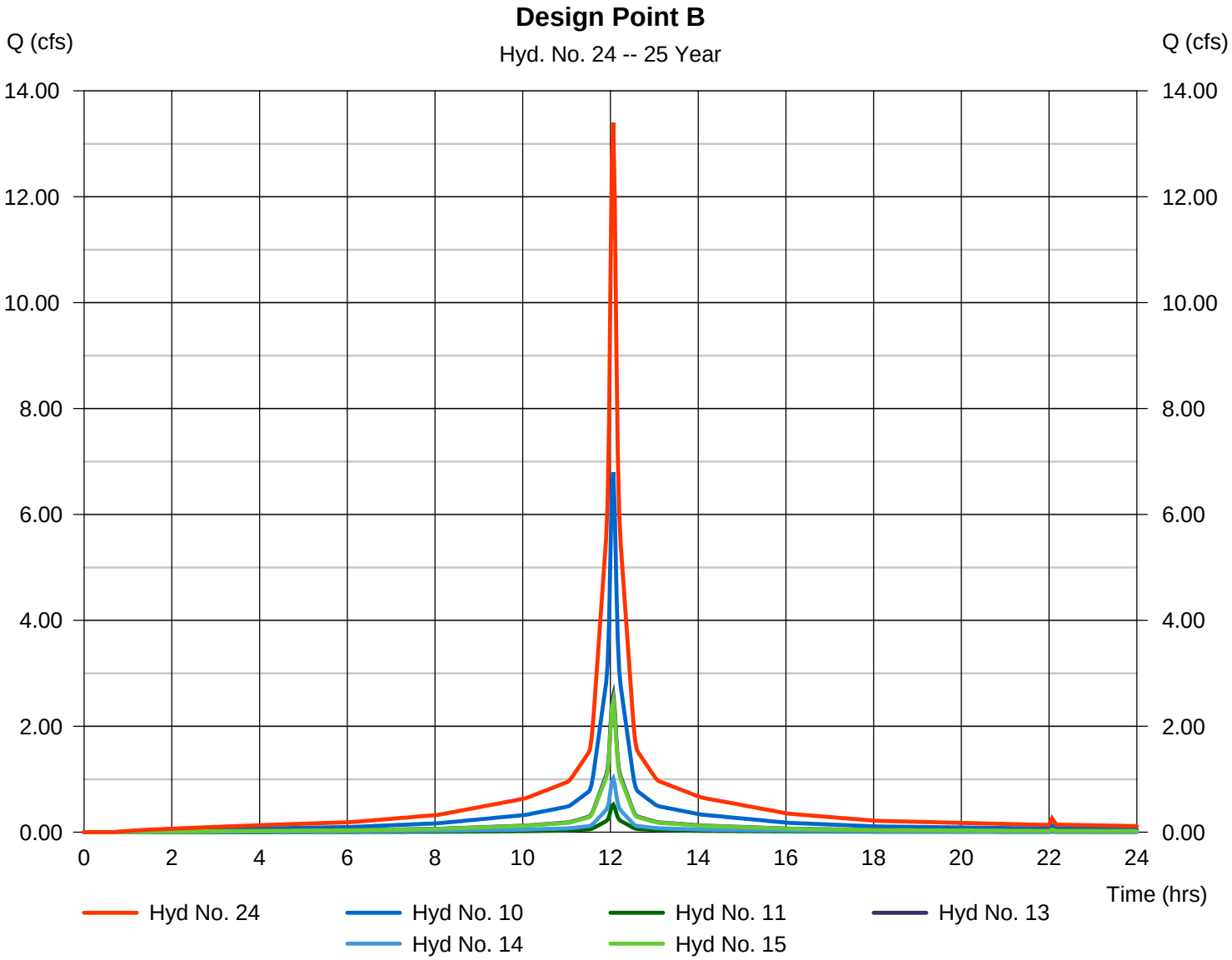
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 24

Design Point B

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 13.40 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 46,339 cuft |
| Inflow hyds. | = 10, 11, 13, 14, 15 | Contrib. drain. area | = 2.169 ac |



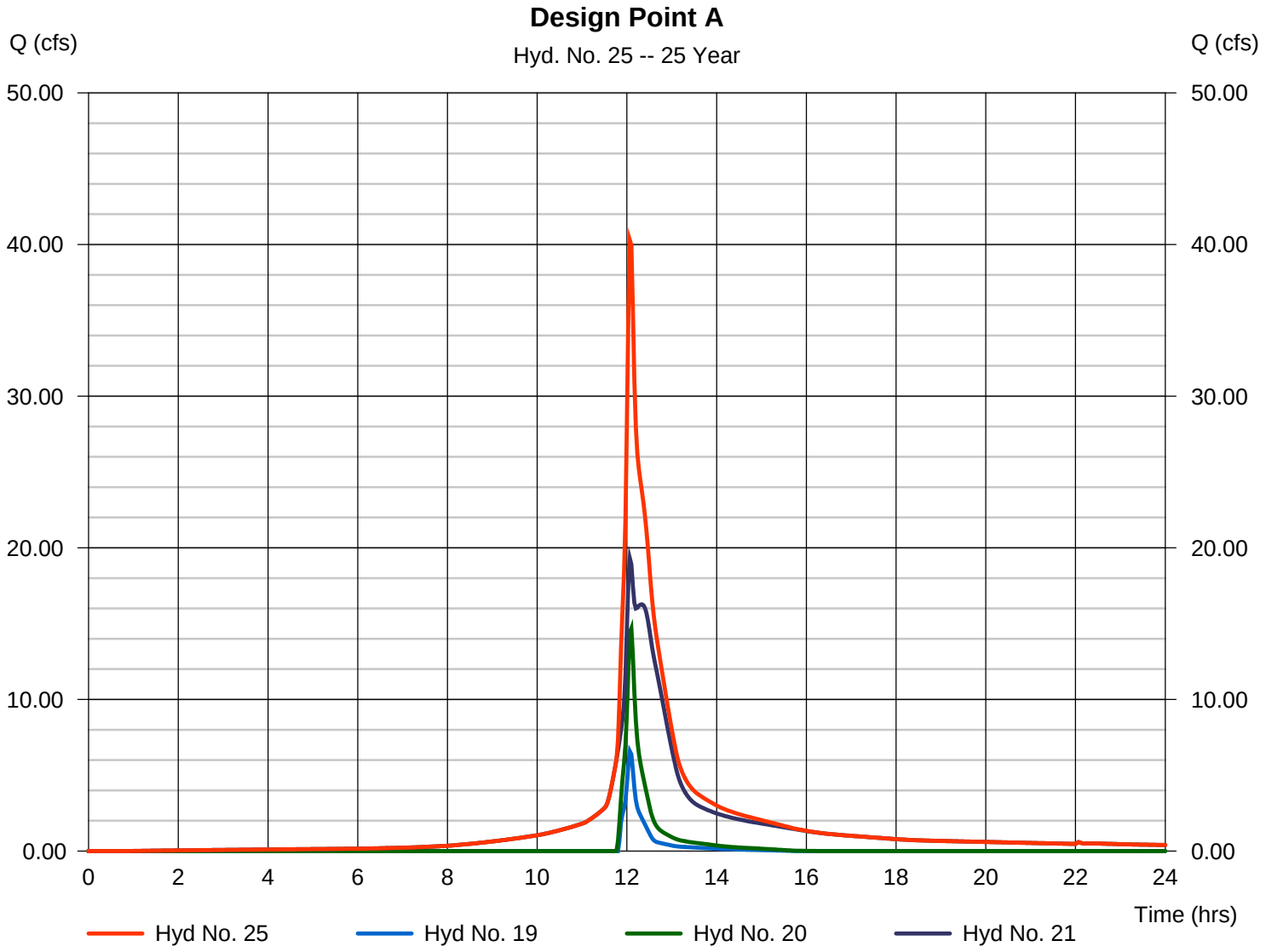
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 25

Design Point A

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 40.28 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 157,283 cuft |
| Inflow hyds. | = 19, 20, 21 | Contrib. drain. area | = 0.000 ac |



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SCS Runoff | 1.351 | 2 | 724 | 4,705 | ------ | ------ | ------ | PR WS 01A Des. PT. C |
| 2 | SCS Runoff | 2.338 | 2 | 738 | 11,667 | ------ | ------ | ------ | PR WS 01 Des. PT. C |
| 3 | SCS Runoff | 7.959 | 2 | 724 | 27,715 | ------ | ------ | ------ | PR WS 03B |
| 4 | SCS Runoff | 18.49 | 2 | 724 | 64,398 | ------ | ------ | ------ | PR WS 03D |
| 5 | SCS Runoff | 3.993 | 2 | 736 | 19,096 | ------ | ------ | ------ | PR WS 03A |
| 6 | SCS Runoff | 11.95 | 2 | 748 | 75,498 | ------ | ------ | ------ | OFFSITE 01 |
| 7 | SCS Runoff | 1.359 | 2 | 726 | 4,673 | ------ | ------ | ------ | OFFSITE 02 |
| 8 | SCS Runoff | 9.981 | 2 | 724 | 34,292 | ------ | ------ | ------ | PR WS 03C |
| 9 | SCS Runoff | 1.492 | 2 | 724 | 5,195 | ------ | ------ | ------ | PR WS 09 |
| 10 | SCS Runoff | 7.727 | 2 | 724 | 26,906 | ------ | ------ | ------ | PR WS 06 |
| 11 | SCS Runoff | 0.598 | 2 | 724 | 1,930 | ------ | ------ | ------ | PR WS 08 |
| 12 | SCS Runoff | 3.413 | 2 | 724 | 11,885 | ------ | ------ | ------ | PR WS 05 |
| 13 | SCS Runoff | 2.934 | 2 | 724 | 10,218 | ------ | ------ | ------ | PR WS 02 |
| 14 | SCS Runoff | 1.154 | 2 | 724 | 4,019 | ------ | ------ | ------ | PR WS 02A |
| 15 | SCS Runoff | 2.822 | 2 | 724 | 9,826 | ------ | ------ | ------ | PR WS 07 |
| 16 | SCS Runoff | 2.440 | 2 | 740 | 12,894 | ------ | ------ | ------ | PR WS 04 |
| 17 | SCS Runoff | 2.041 | 2 | 724 | 7,106 | ------ | ------ | ------ | PR WS 04A |
| 18 | Reservoir | 1.317 | 2 | 724 | 2,207 | 1 | 47.29 | 746 | Design Point C Storage |
| 19 | Reservoir | 7.525 | 2 | 724 | 12,821 | 3 | 46.00 | 5,185 | COURTYARD INF |
| 20 | Reservoir | 16.79 | 2 | 726 | 29,924 | 4 | 44.46 | 12,162 | South Inf |
| 21 | Combine | 22.51 | 2 | 724 | 145,444 | 5, 6, 7, 8, 12, | ------ | ------ | Flow to Design Point A |
| 22 | Combine | 3.428 | 2 | 724 | 20,000 | 16, 17, | ------ | ------ | Design Point D |
| 23 | Combine | 2.815 | 2 | 736 | 13,874 | 2, 18, | ------ | ------ | DESIGN POINT C |
| 24 | Combine | 15.23 | 2 | 724 | 52,899 | 10, 11, 13, 14, 15, | ------ | ------ | Design Point B |
| 25 | Combine | 46.65 | 2 | 724 | 188,190 | 19, 20, 21, | ------ | ------ | Design Point A |

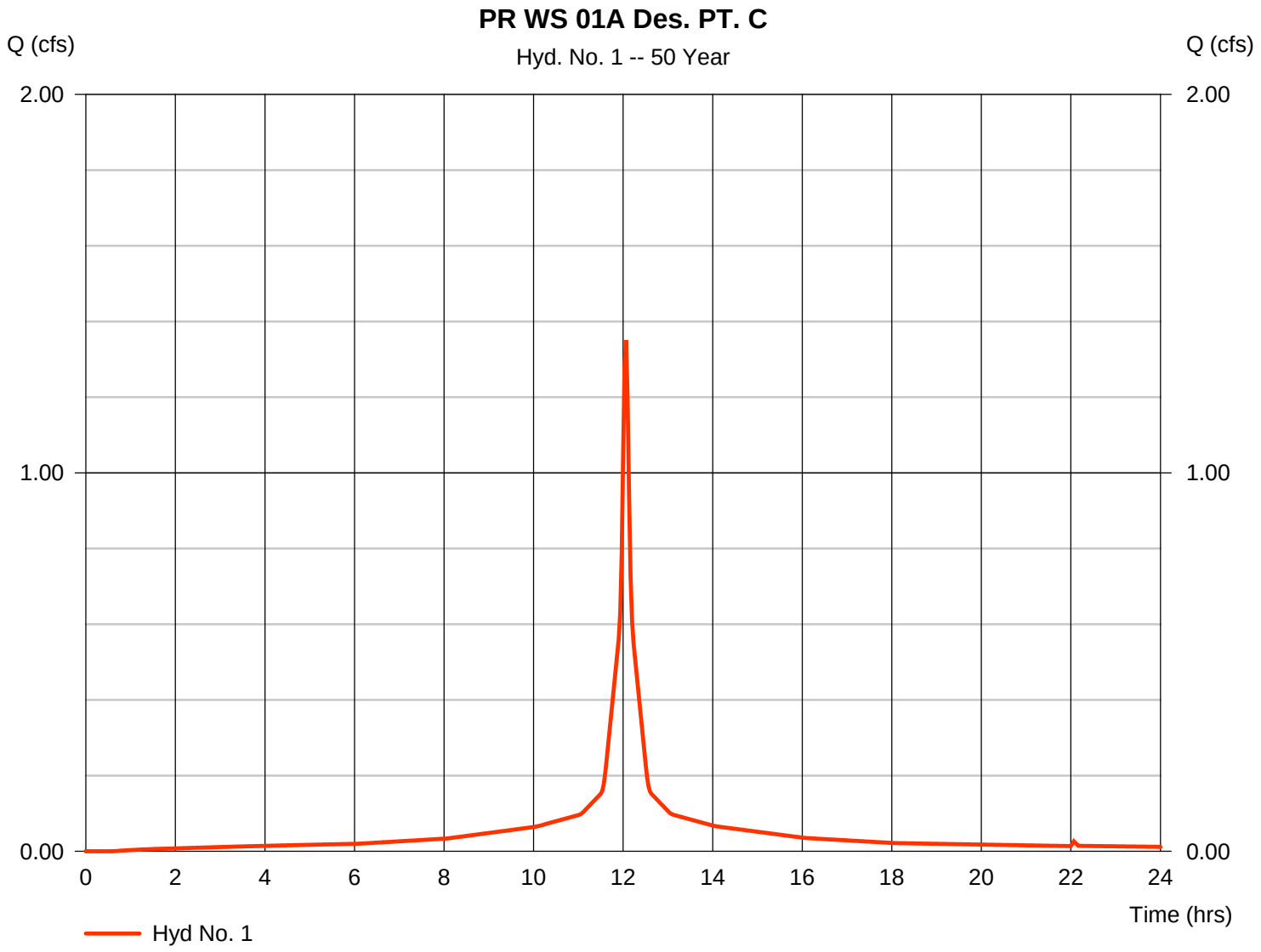
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 1

PR WS 01A Des. PT. C

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 1.351 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 4,705 cuft |
| Drainage area | = | 0.192 ac | Curve number | = | 98 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 7.44 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



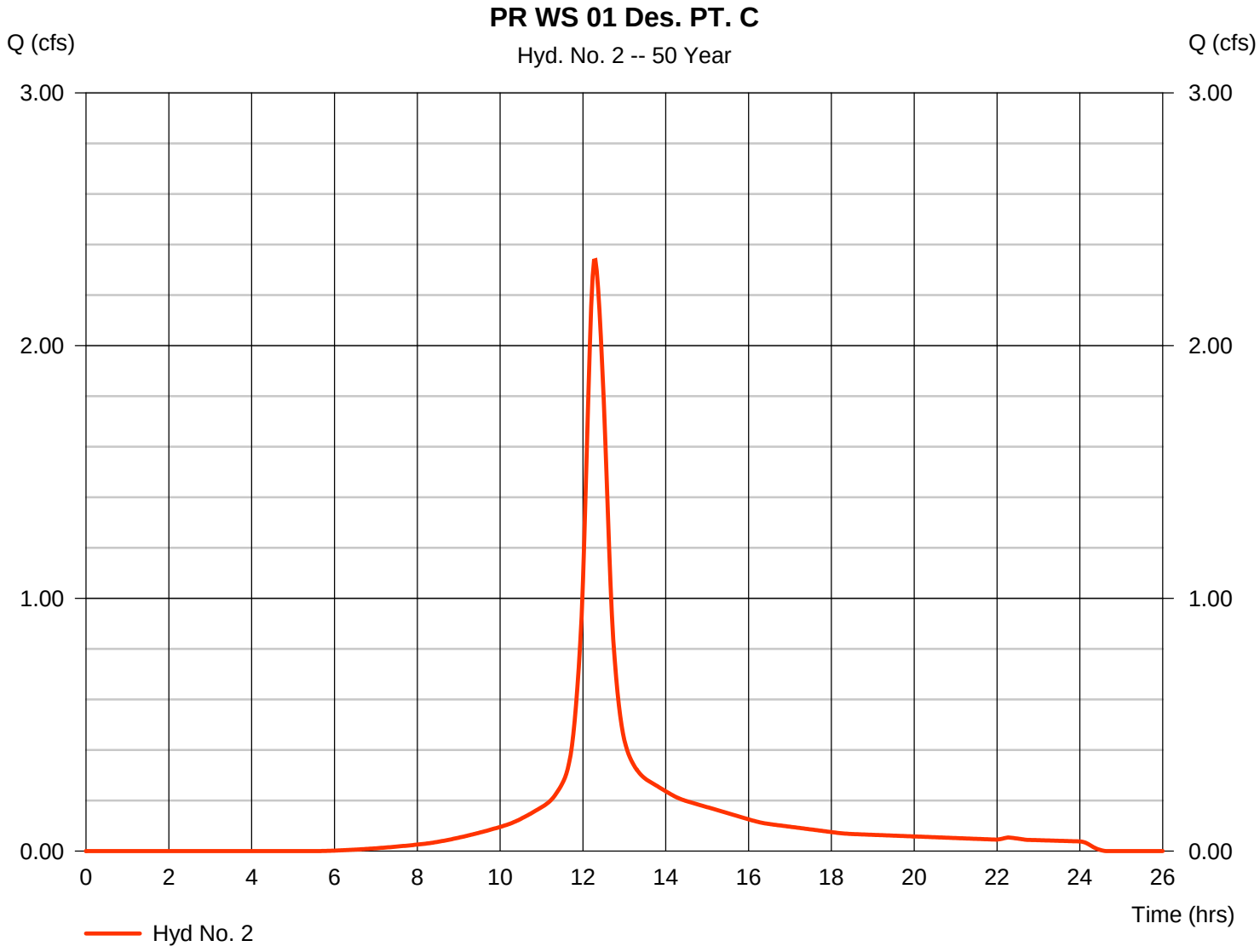
# Hydrograph Report



## Hyd. No. 2

PR WS 01 Des. PT. C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.338 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.30 hrs |
| Time interval | = 2 min | Hyd. volume | = 11,667 cuft |
| Drainage area | = 0.626 ac | Curve number | = 81 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 25.80 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



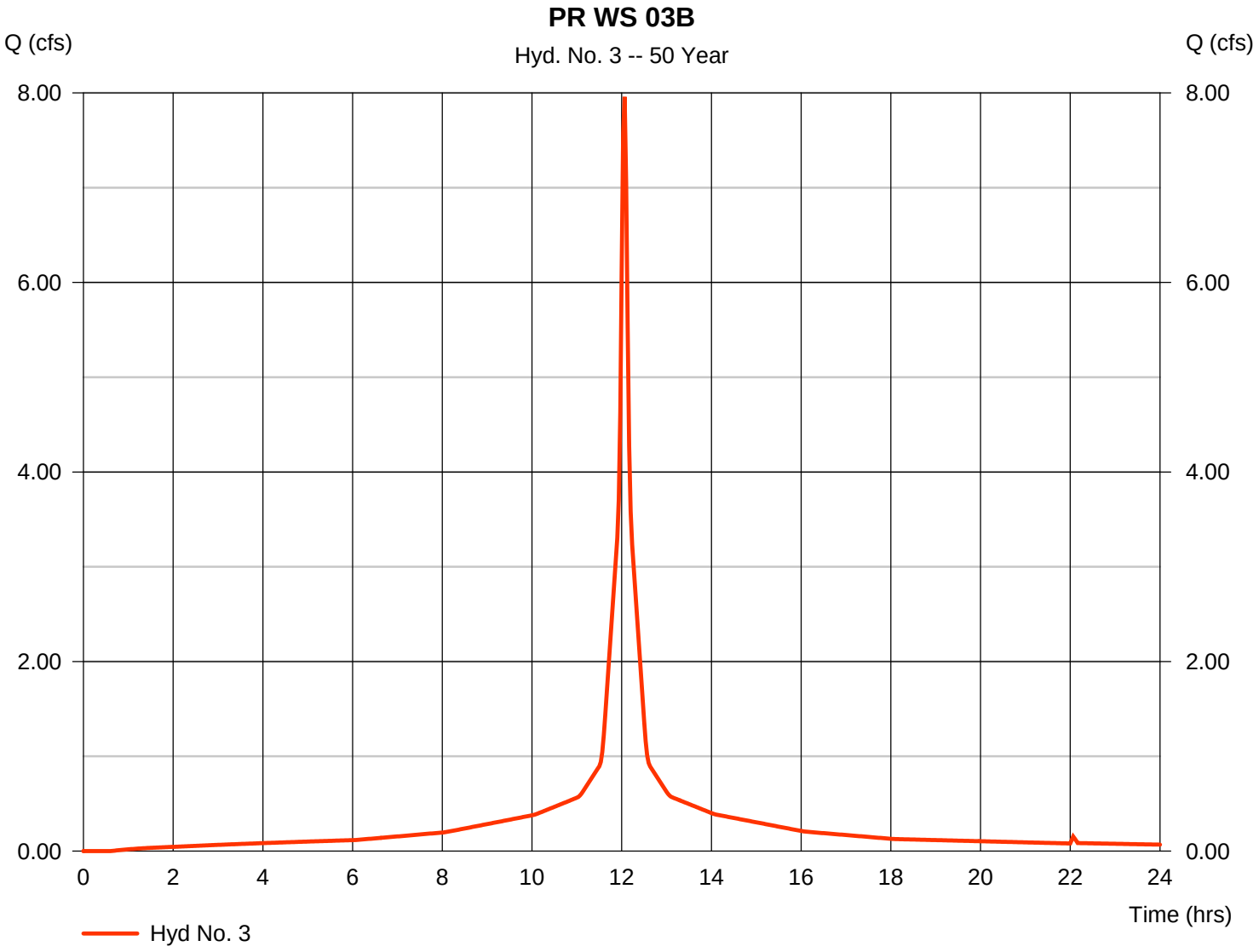
# Hydrograph Report



## Hyd. No. 3

PR WS 03B

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 7.959 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 27,715 cuft |
| Drainage area | = | 1.131 ac | Curve number | = | 98 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 5.00 min |
| Total precip. | = | 7.44 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



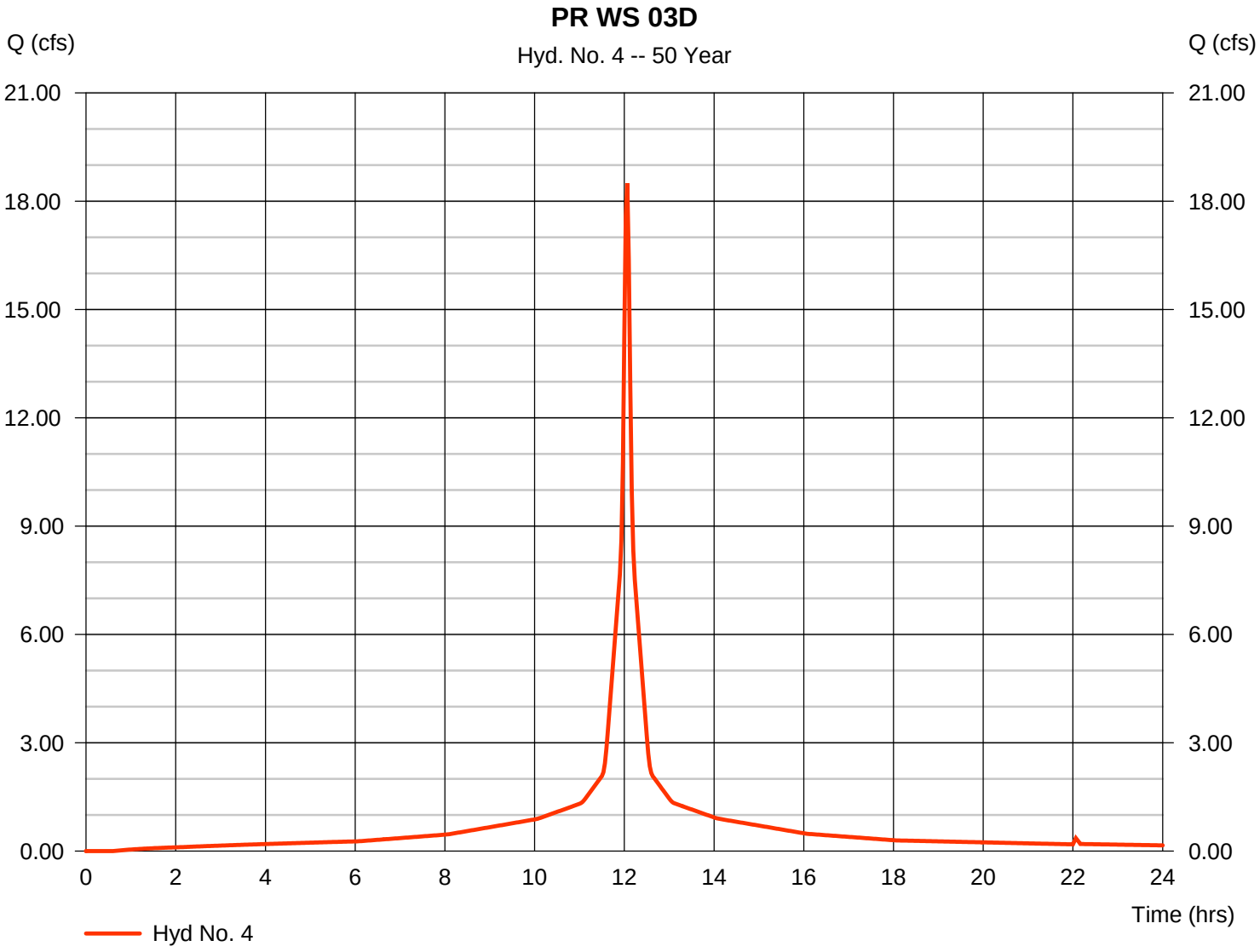
# Hydrograph Report



## Hyd. No. 4

PR WS 03D

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 18.49 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 64,398 cuft |
| Drainage area | = 2.628 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



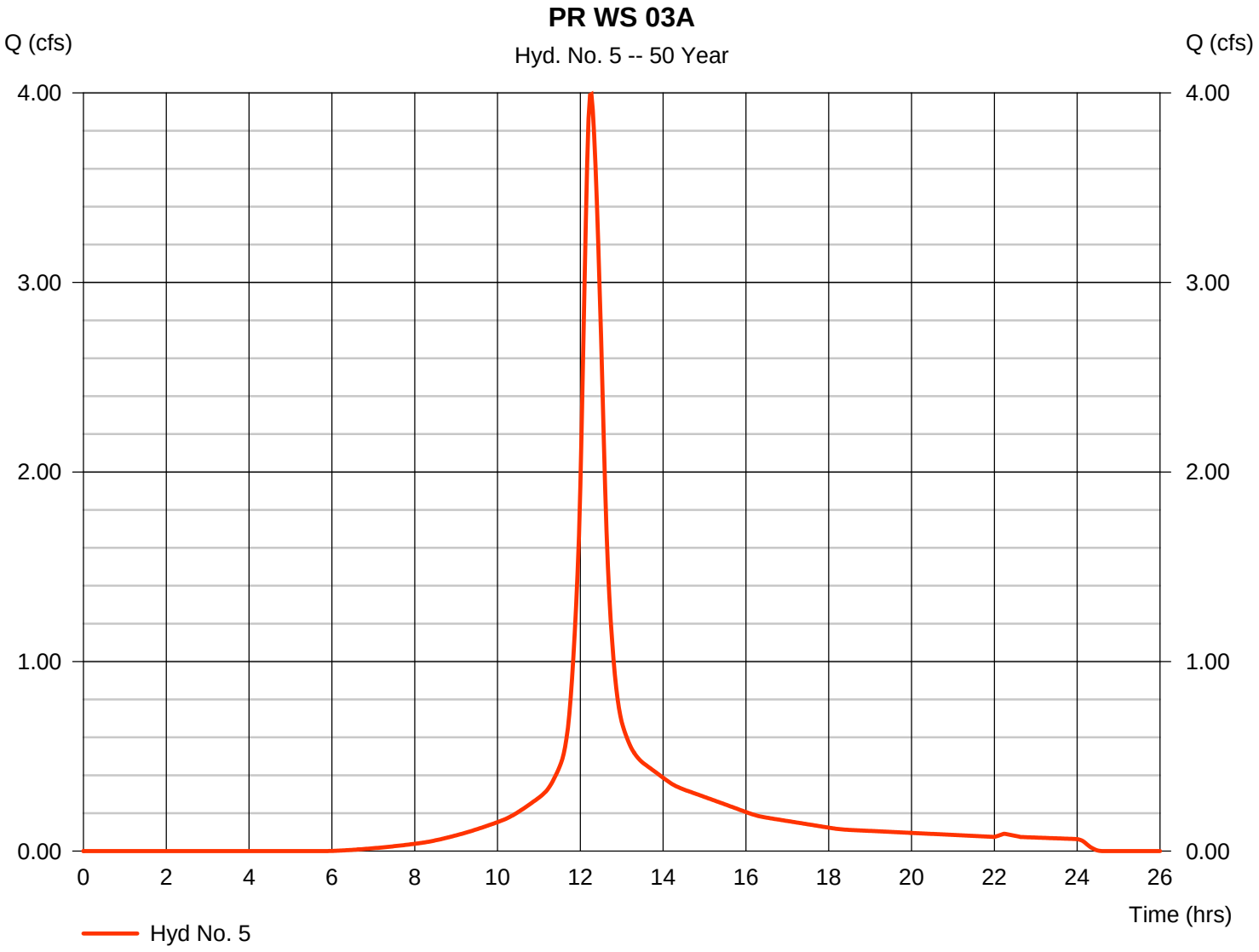
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 5

PR WS 03A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 3.993 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.27 hrs |
| Time interval | = 2 min | Hyd. volume | = 19,096 cuft |
| Drainage area | = 1.013 ac | Curve number | = 80 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 20.70 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



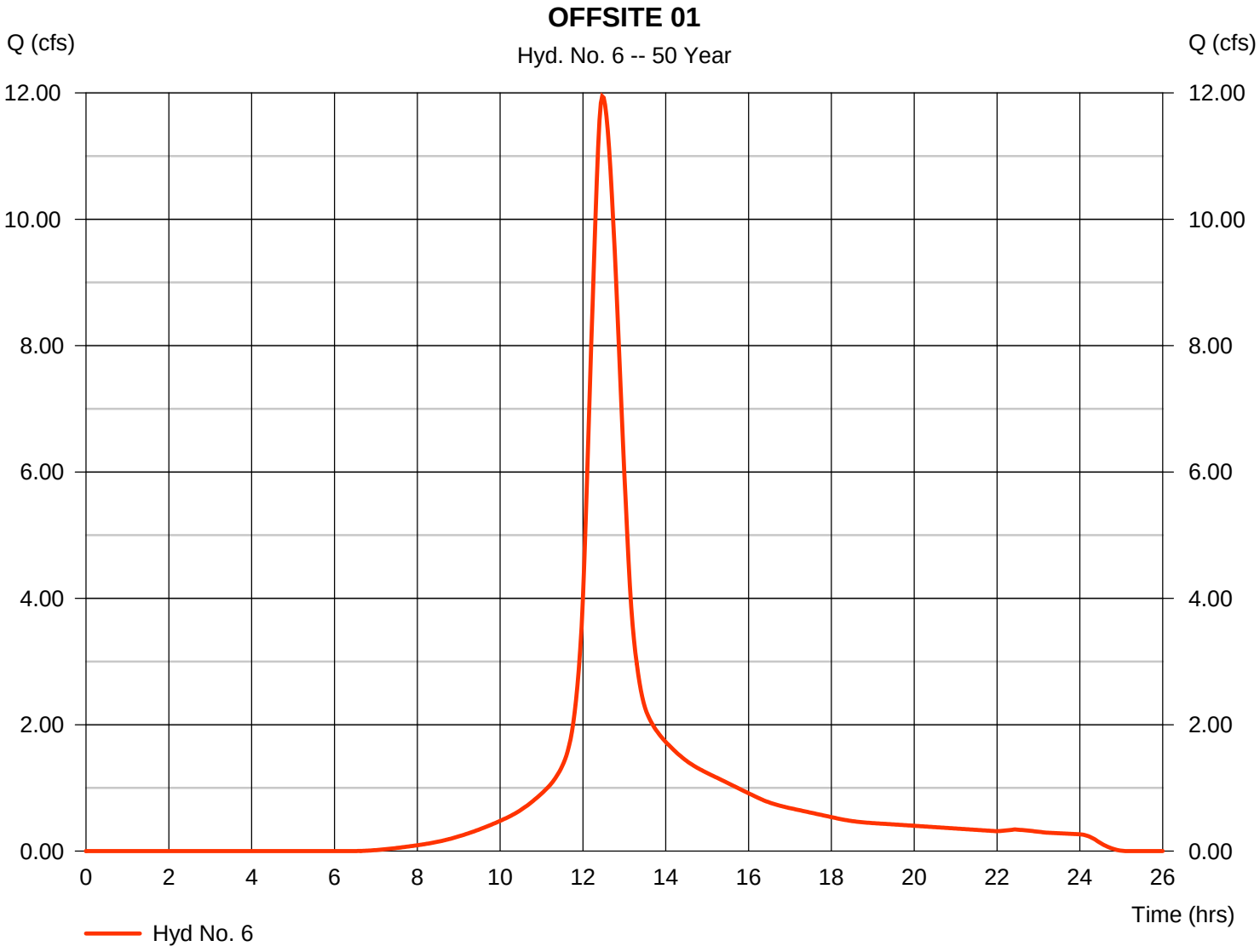
# Hydrograph Report



## Hyd. No. 6

OFFSITE 01

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | SCS Runoff | Peak discharge | = | 11.95 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 12.47 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 75,498 cuft |
| Drainage area | = | 4.225 ac | Curve number | = | 78 |
| Basin Slope | = | 0.0 % | Hydraulic length | = | 0 ft |
| Tc method | = | User | Time of conc. (Tc) | = | 41.40 min |
| Total precip. | = | 7.44 in | Distribution | = | Type III |
| Storm duration | = | 24 hrs | Shape factor | = | 484 |



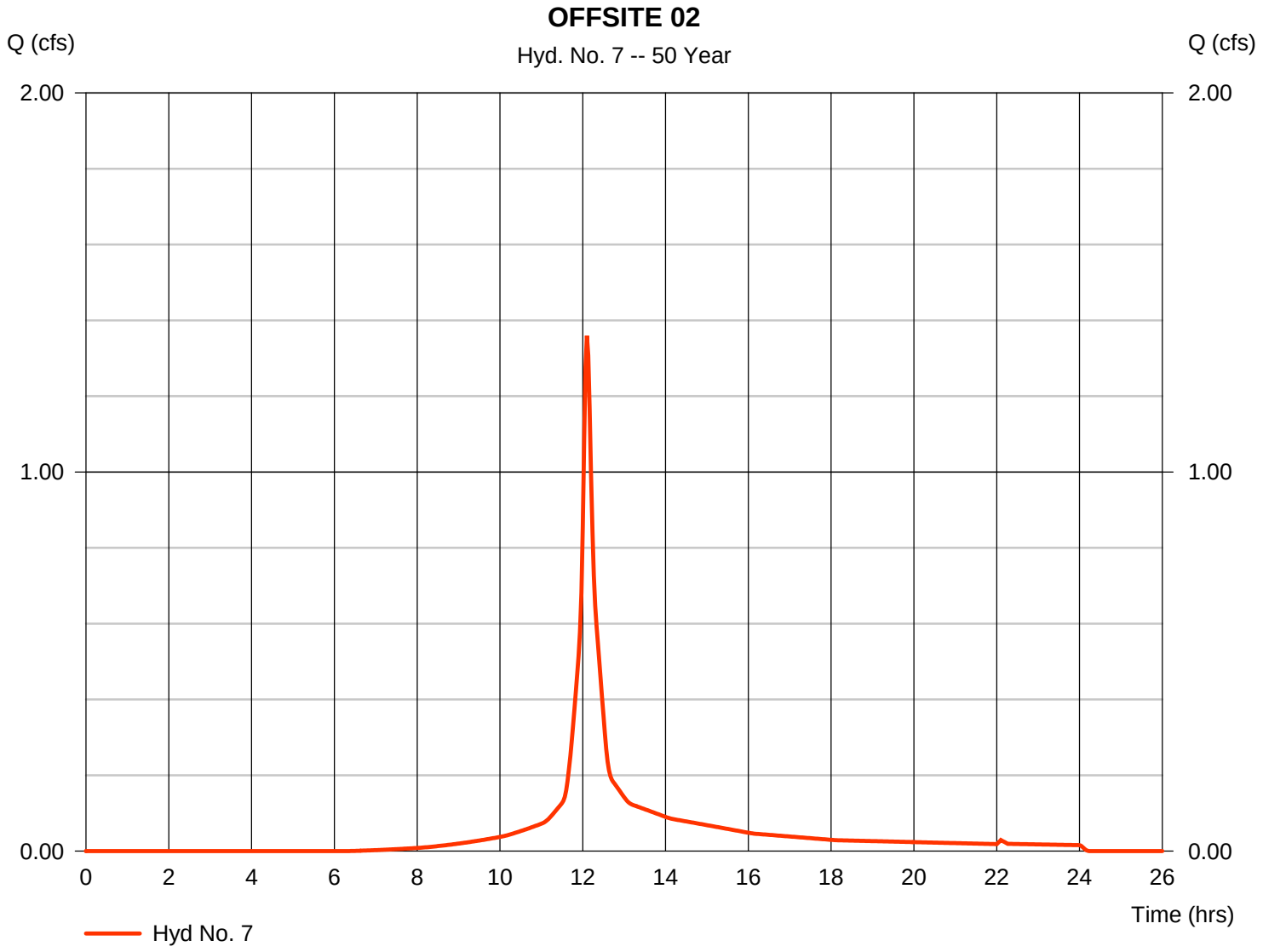
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 7

OFFSITE 02

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.359 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.10 hrs |
| Time interval | = 2 min | Hyd. volume | = 4,673 cuft |
| Drainage area | = 0.264 ac | Curve number | = 78 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 7.10 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



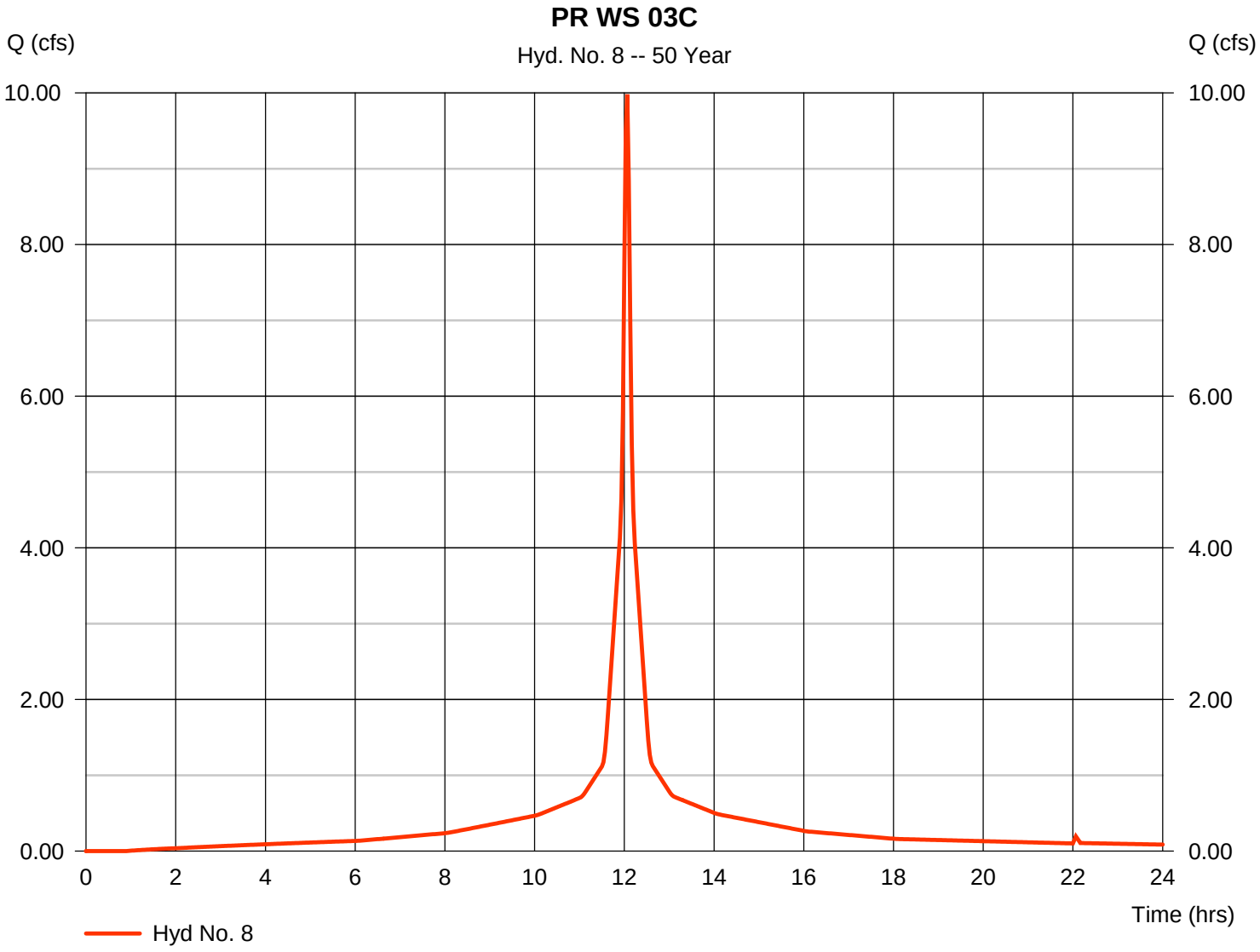
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 8

PR WS 03C

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 9.981 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 34,292 cuft |
| Drainage area | = 1.423 ac | Curve number | = 97 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



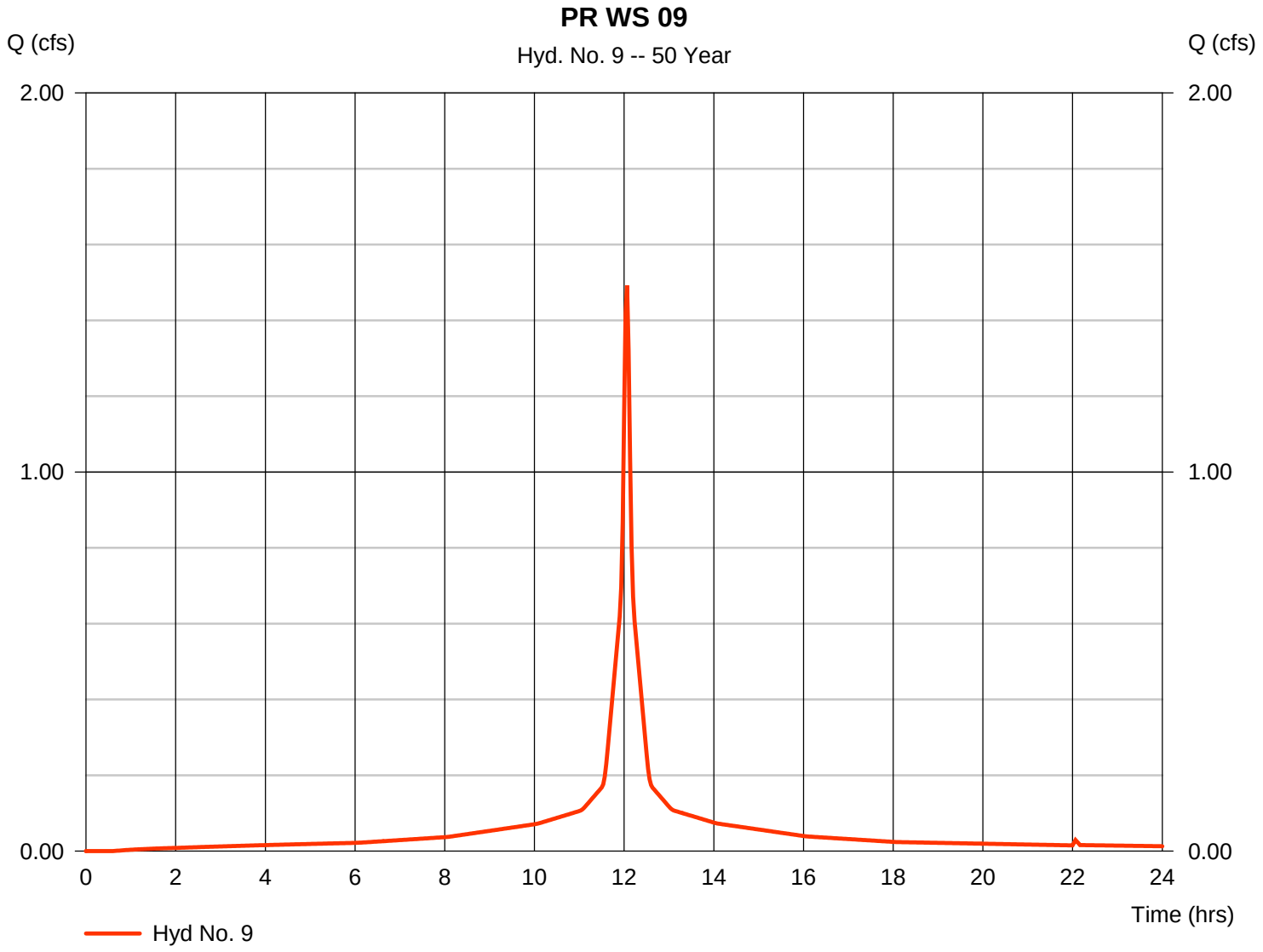
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 9

PR WS 09

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.492 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 5,195 cuft |
| Drainage area | = 0.212 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



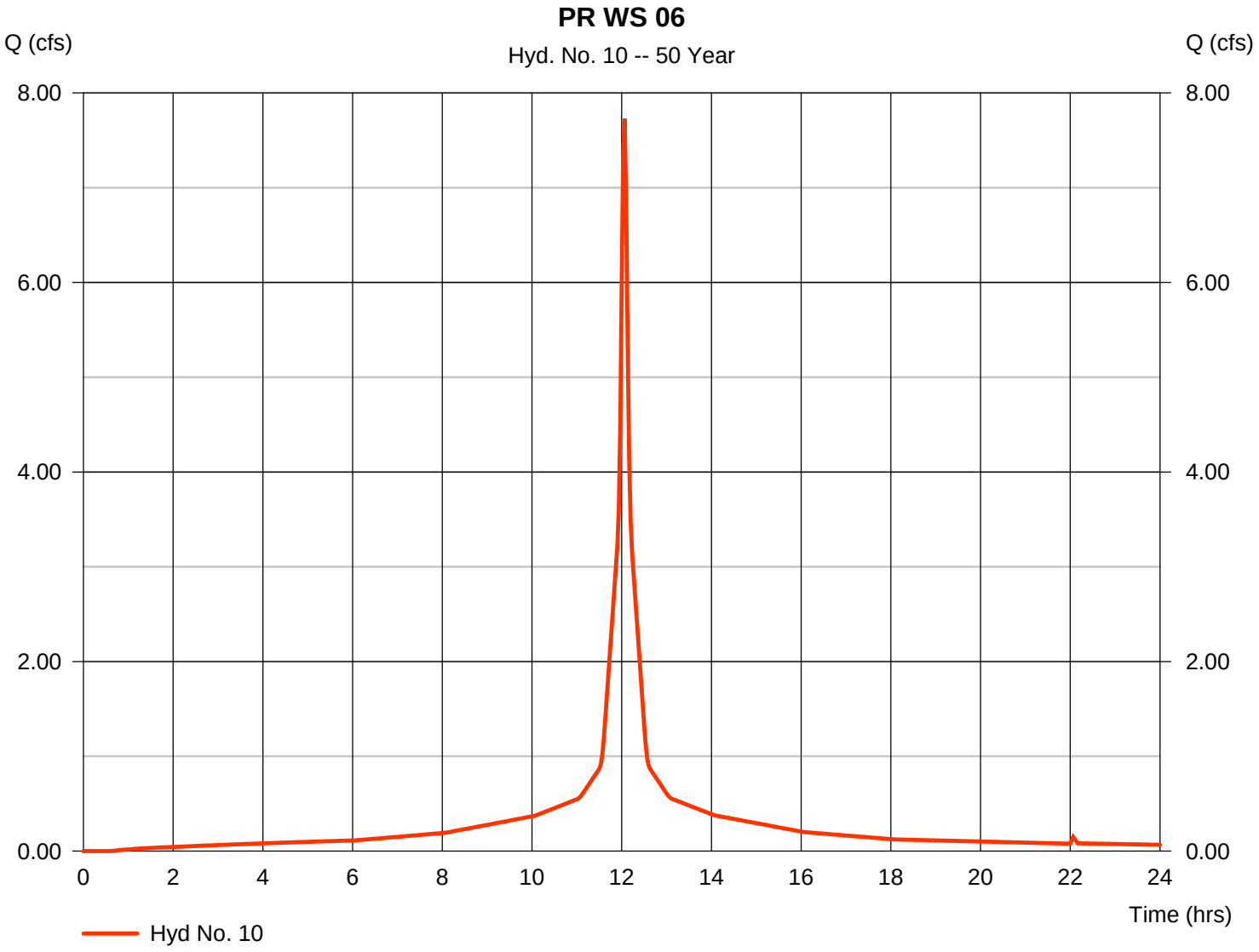
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 10

PR WS 06

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 7.727 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 26,906 cuft |
| Drainage area | = 1.098 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



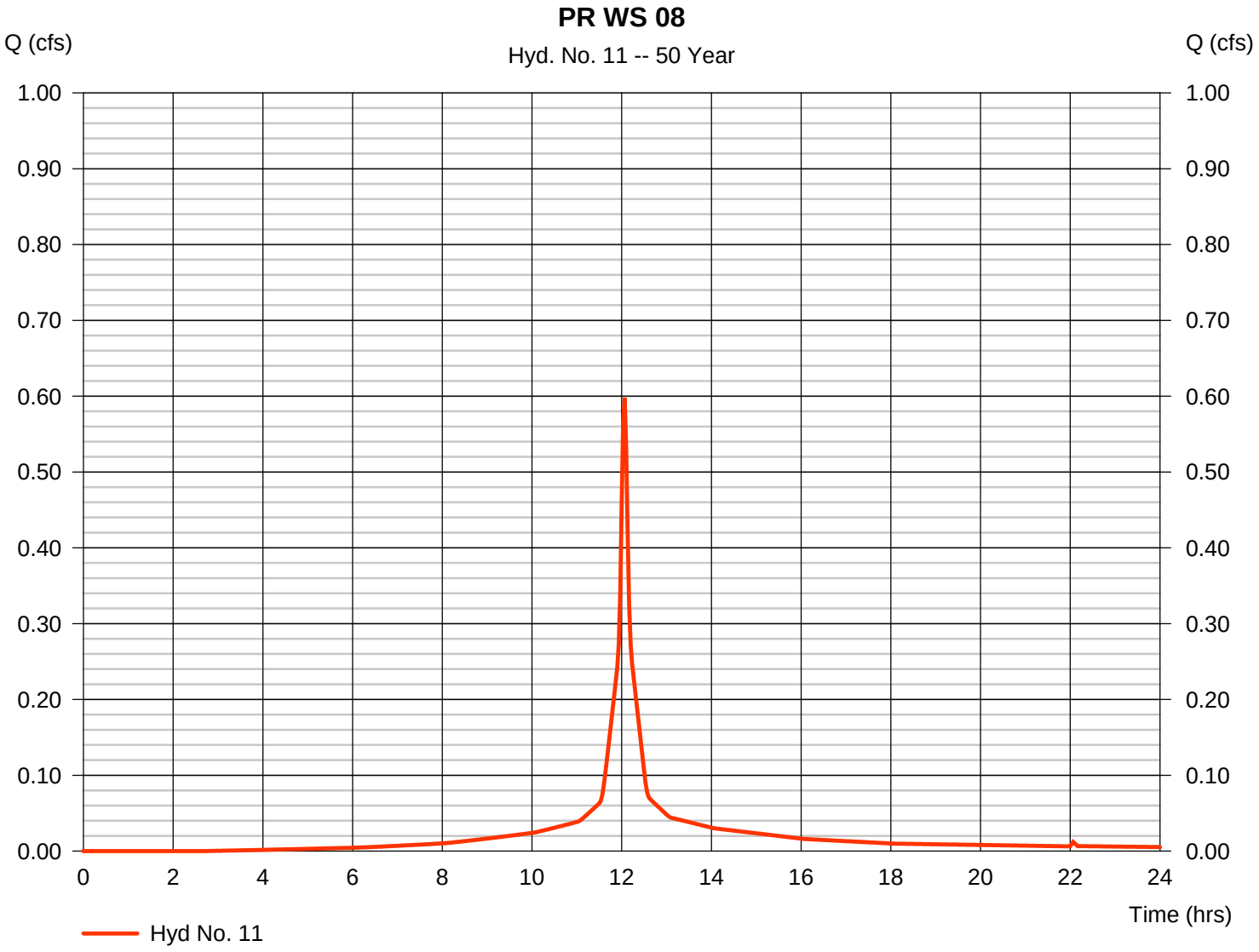
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 11

PR WS 08

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 0.598 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 1,930 cuft |
| Drainage area | = 0.089 ac | Curve number | = 91 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



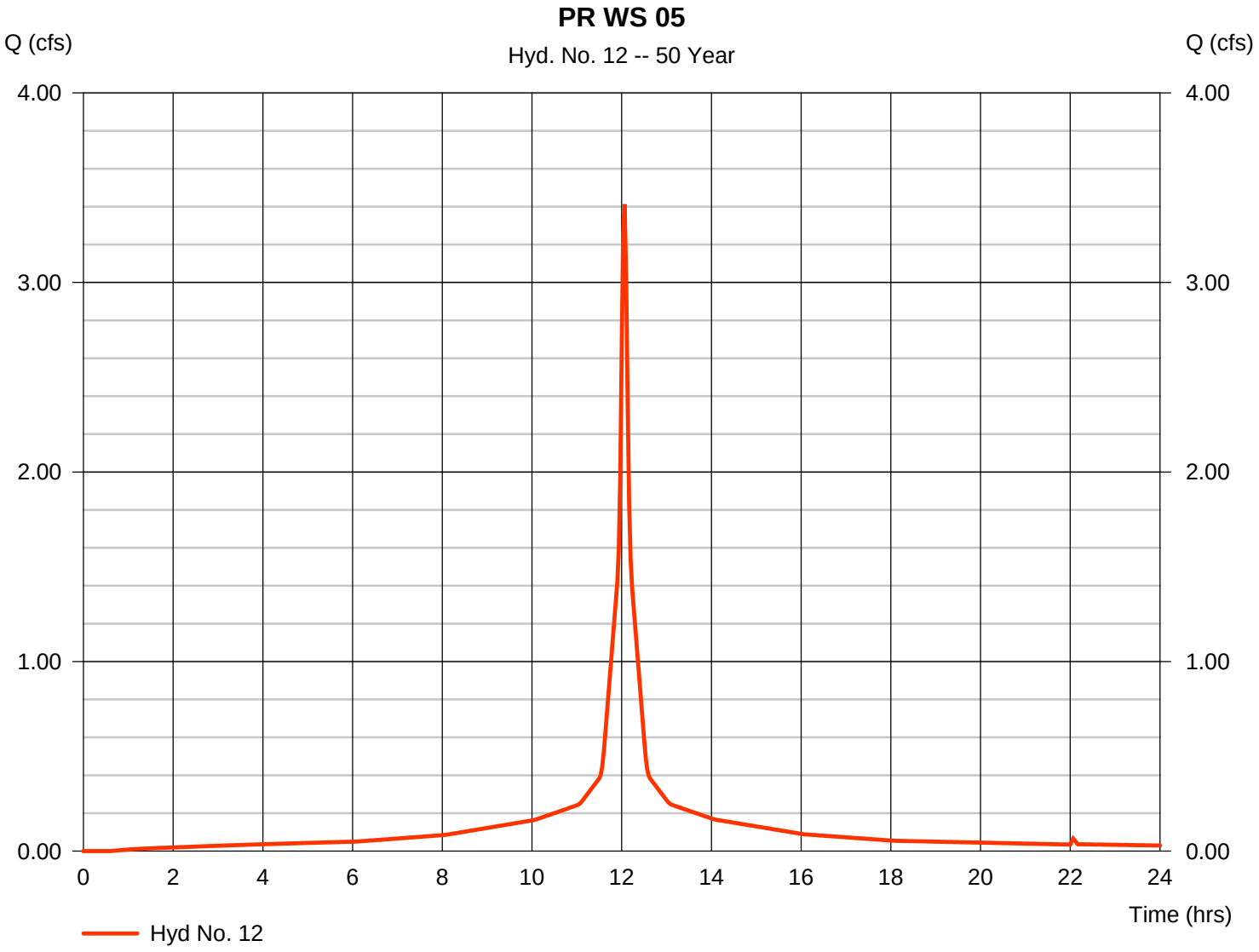
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 12

PR WS 05

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 3.413 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 11,885 cuft |
| Drainage area | = 0.485 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



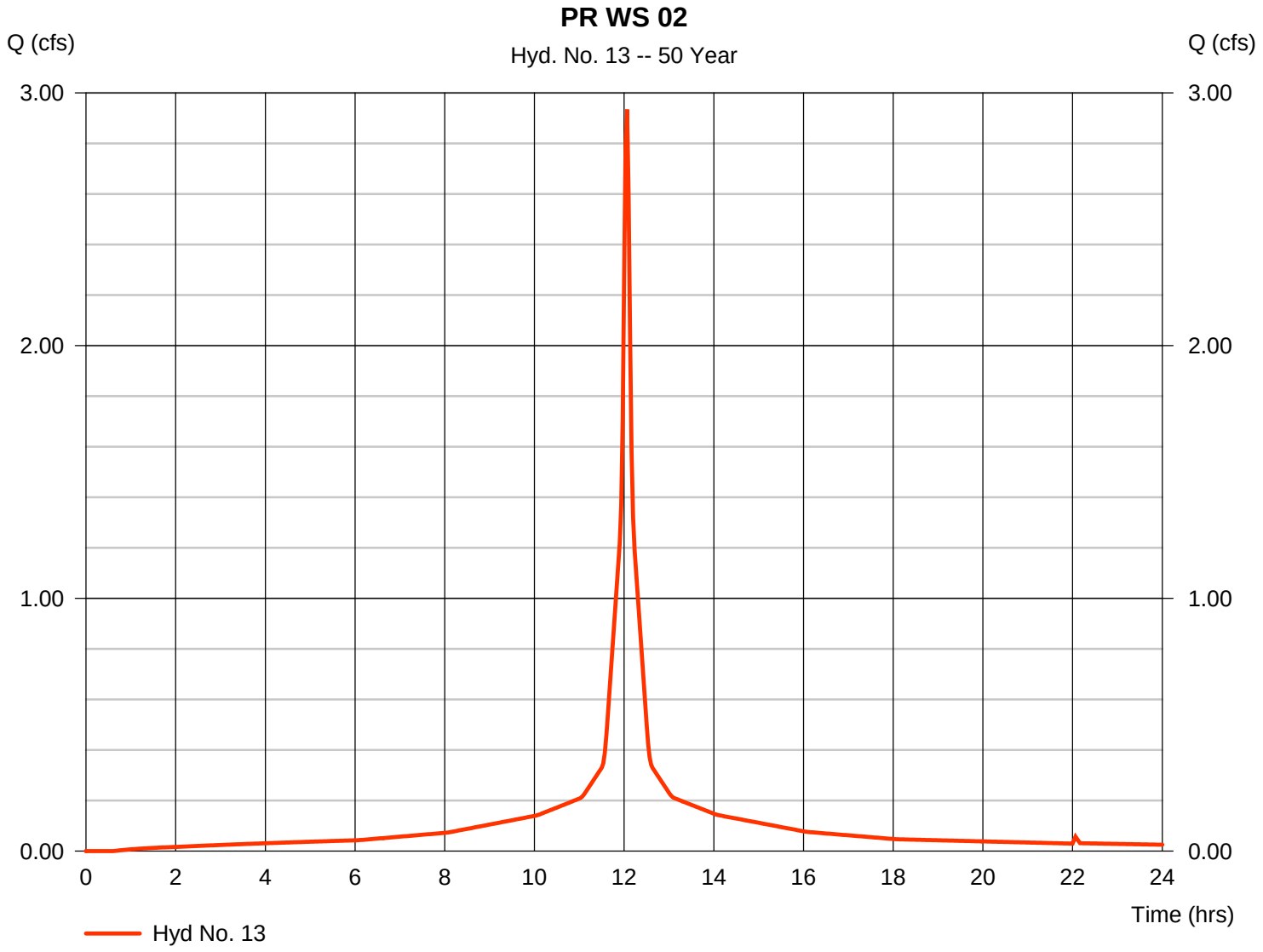
# Hydrograph Report



## Hyd. No. 13

PR WS 02

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.934 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 10,218 cuft |
| Drainage area | = 0.417 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



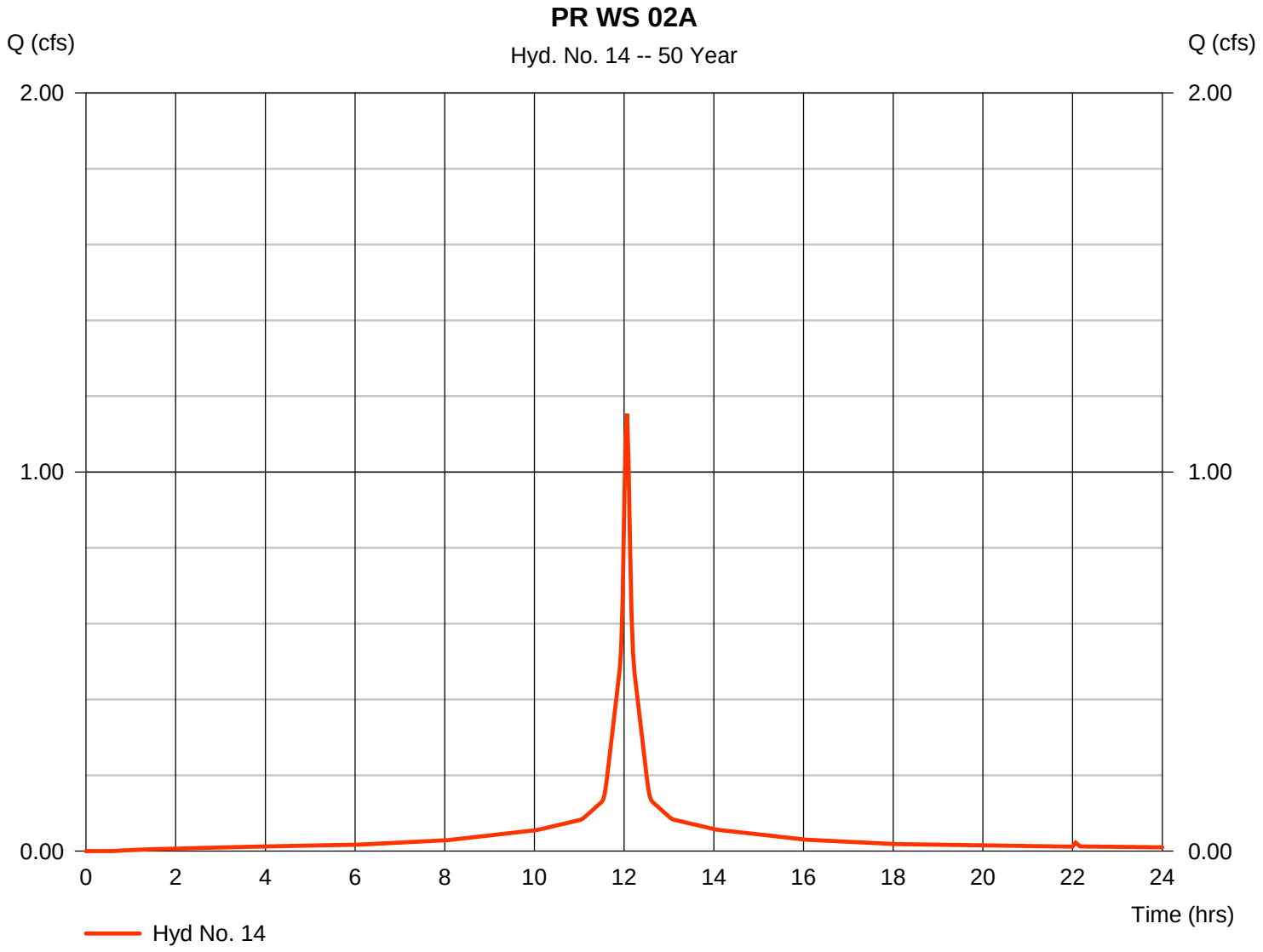
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 14

PR WS 02A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 1.154 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 4,019 cuft |
| Drainage area | = 0.164 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



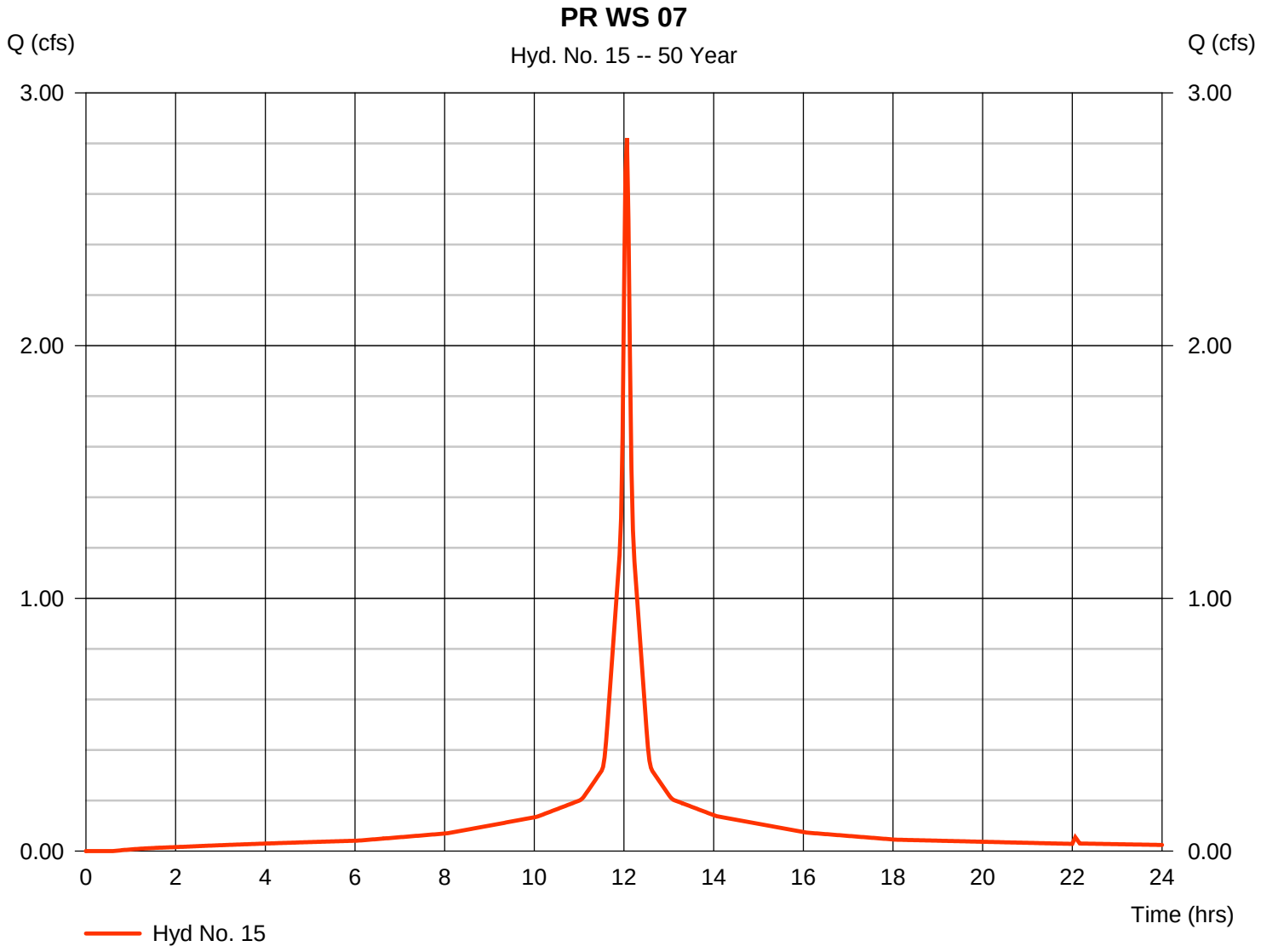
# Hydrograph Report



## Hyd. No. 15

PR WS 07

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.822 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 9,826 cuft |
| Drainage area | = 0.401 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



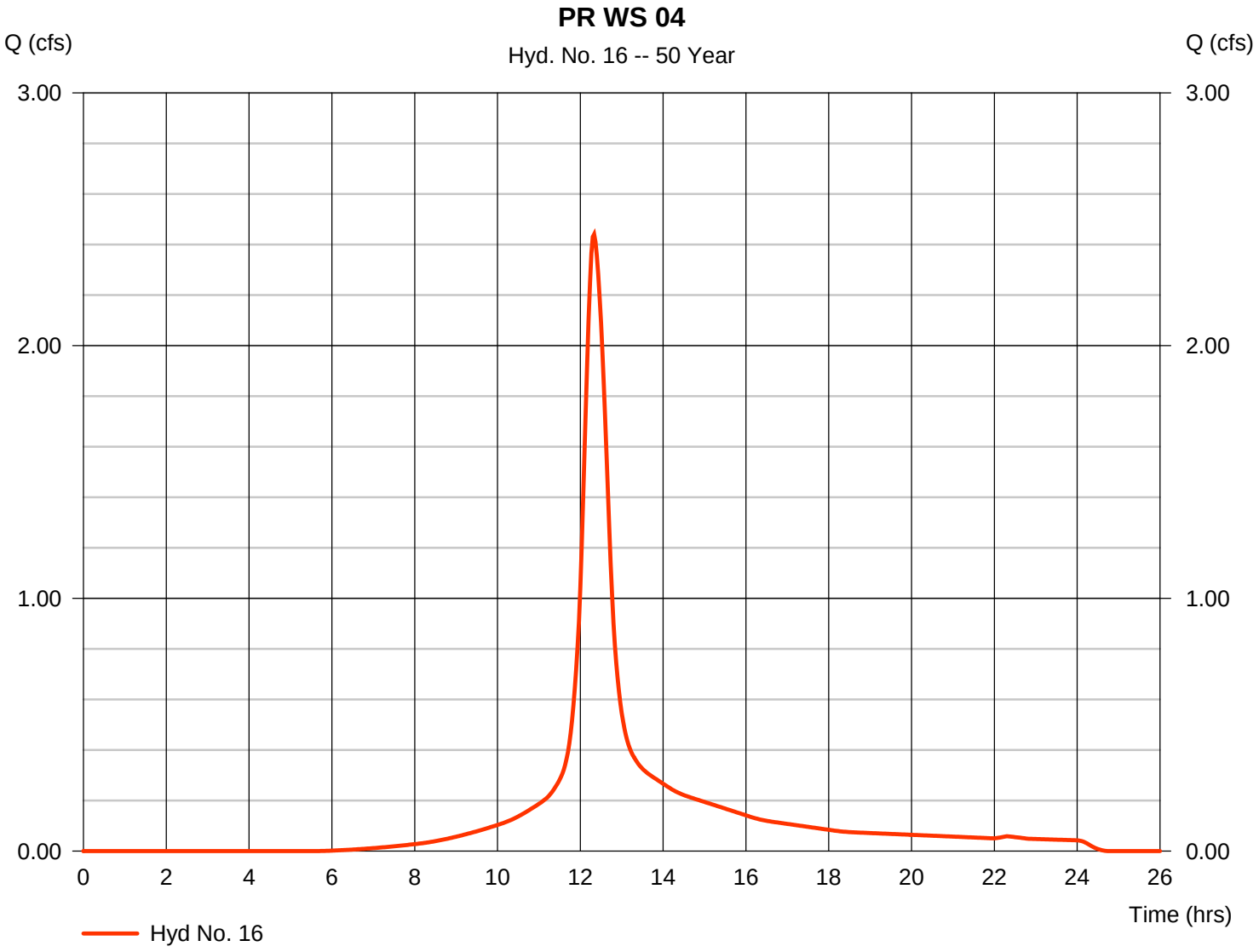
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 16

PR WS 04

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.440 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.33 hrs |
| Time interval | = 2 min | Hyd. volume | = 12,894 cuft |
| Drainage area | = 0.681 ac | Curve number | = 81 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 29.80 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



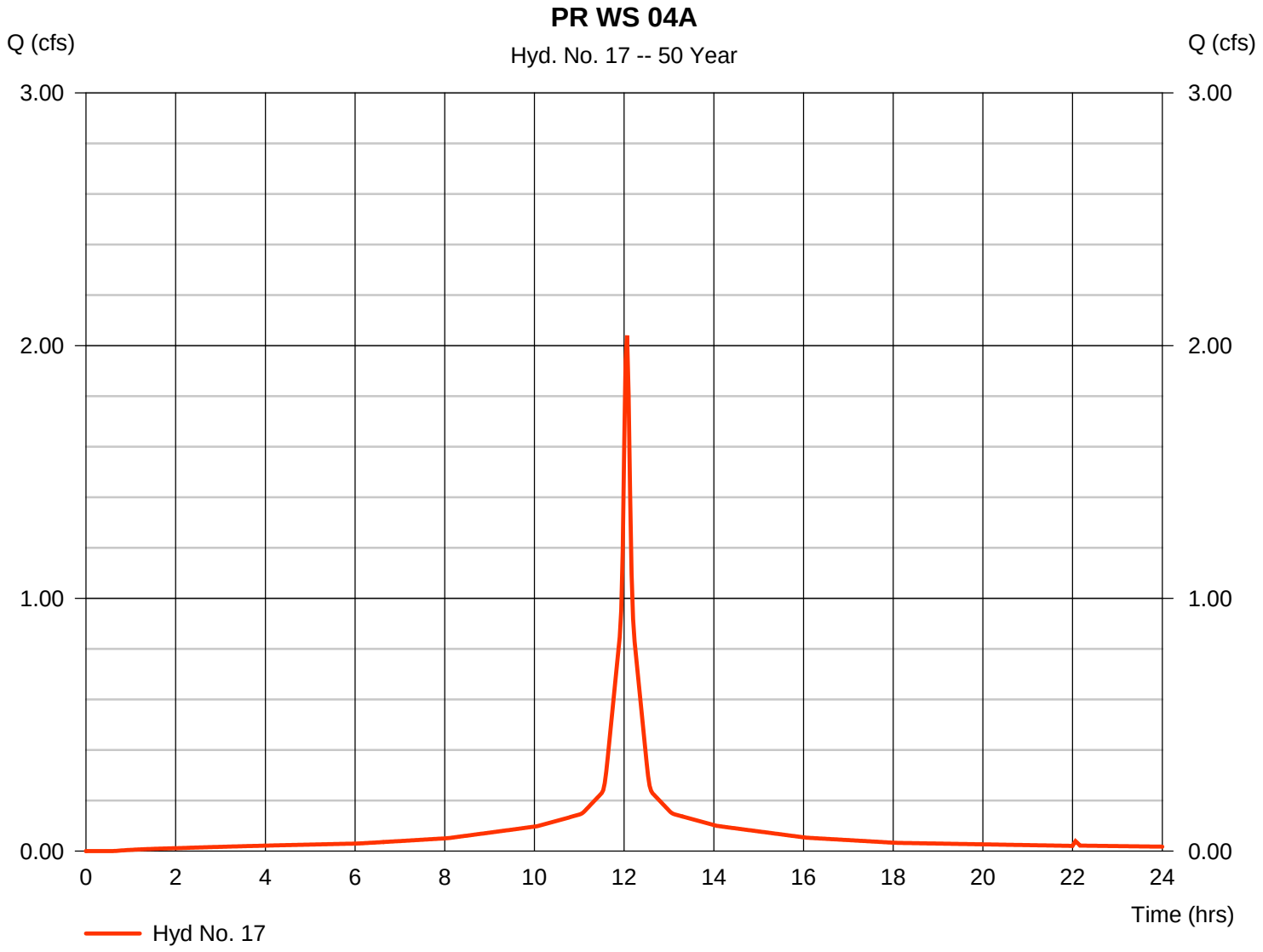
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 17

PR WS 04A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 2.041 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 7,106 cuft |
| Drainage area | = 0.290 ac | Curve number | = 98 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 5.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



# Hydrograph Report

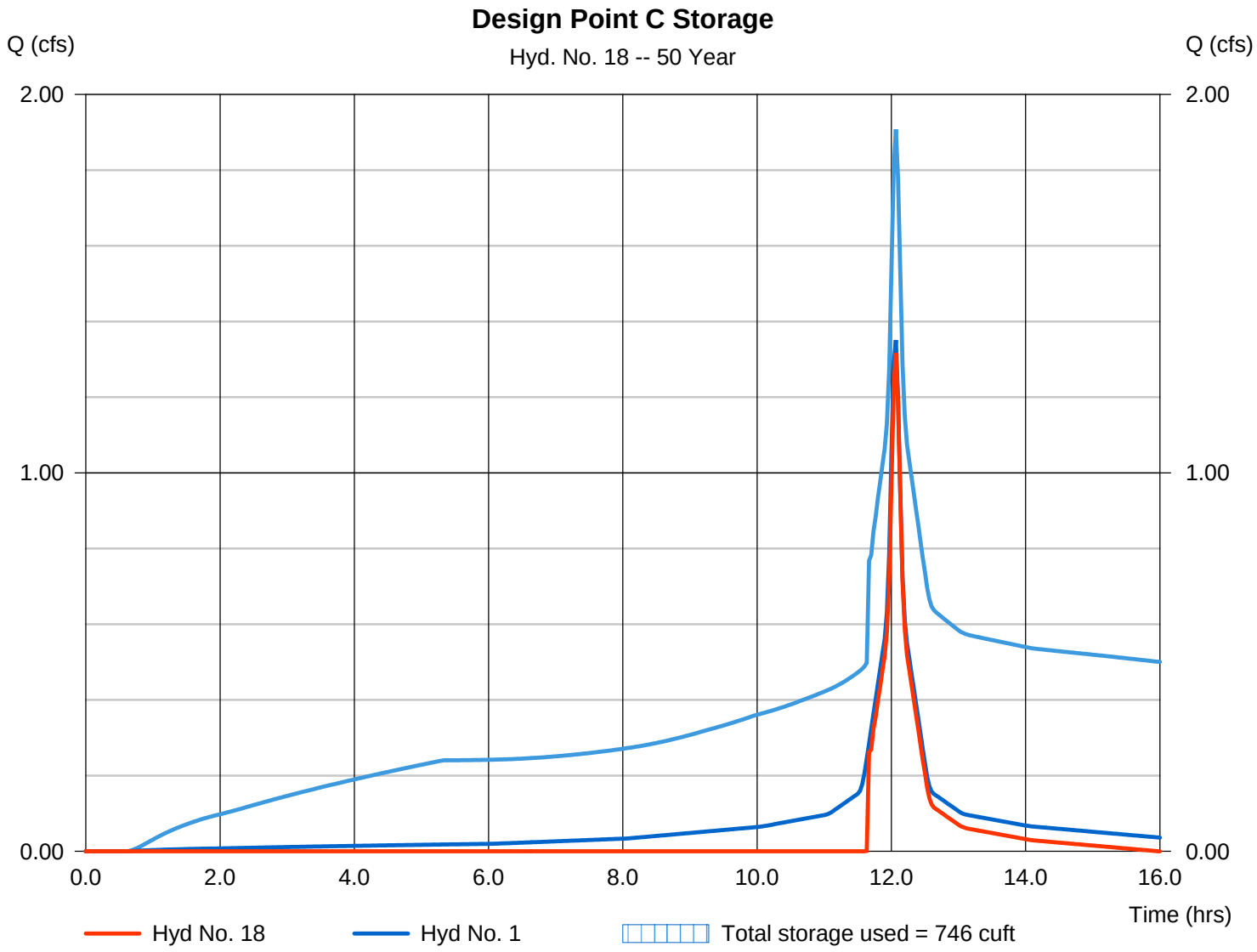
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 18

Design Point C Storage

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 1.317 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 2,207 cuft |
| Inflow hyd. No. | = | 1 - PR WS 01A Des. PT. C | Max. Elevation | = | 47.29 ft |
| Reservoir name | = | DESIGN POINT C STORAGE | Max. Storage | = | 746 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Report

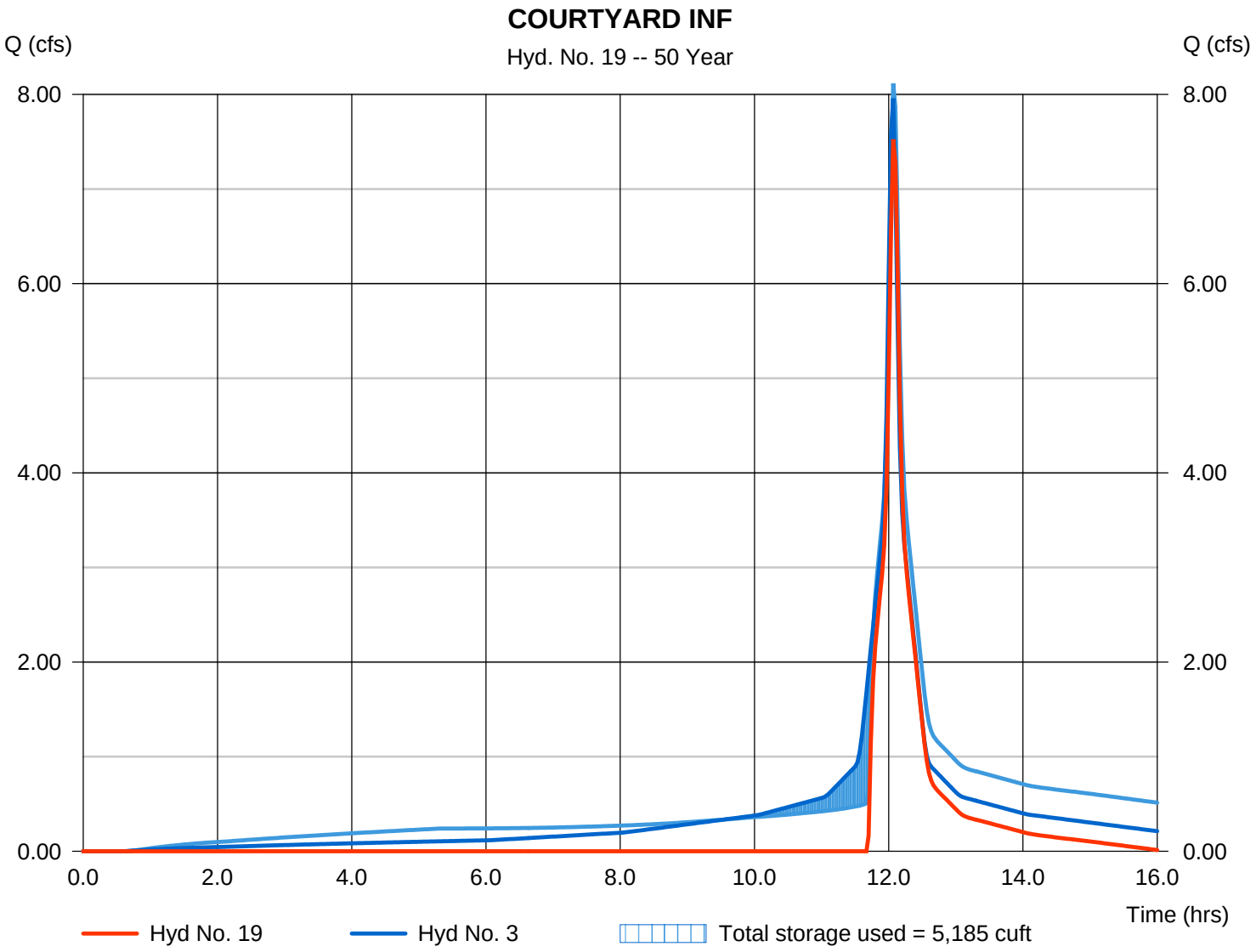
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 19

COURTYARD INF

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 7.525 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 12.07 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 12,821 cuft |
| Inflow hyd. No. | = | 3 - PR WS 03B | Max. Elevation | = | 46.00 ft |
| Reservoir name | = | Courtyard | Max. Storage | = | 5,185 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Report

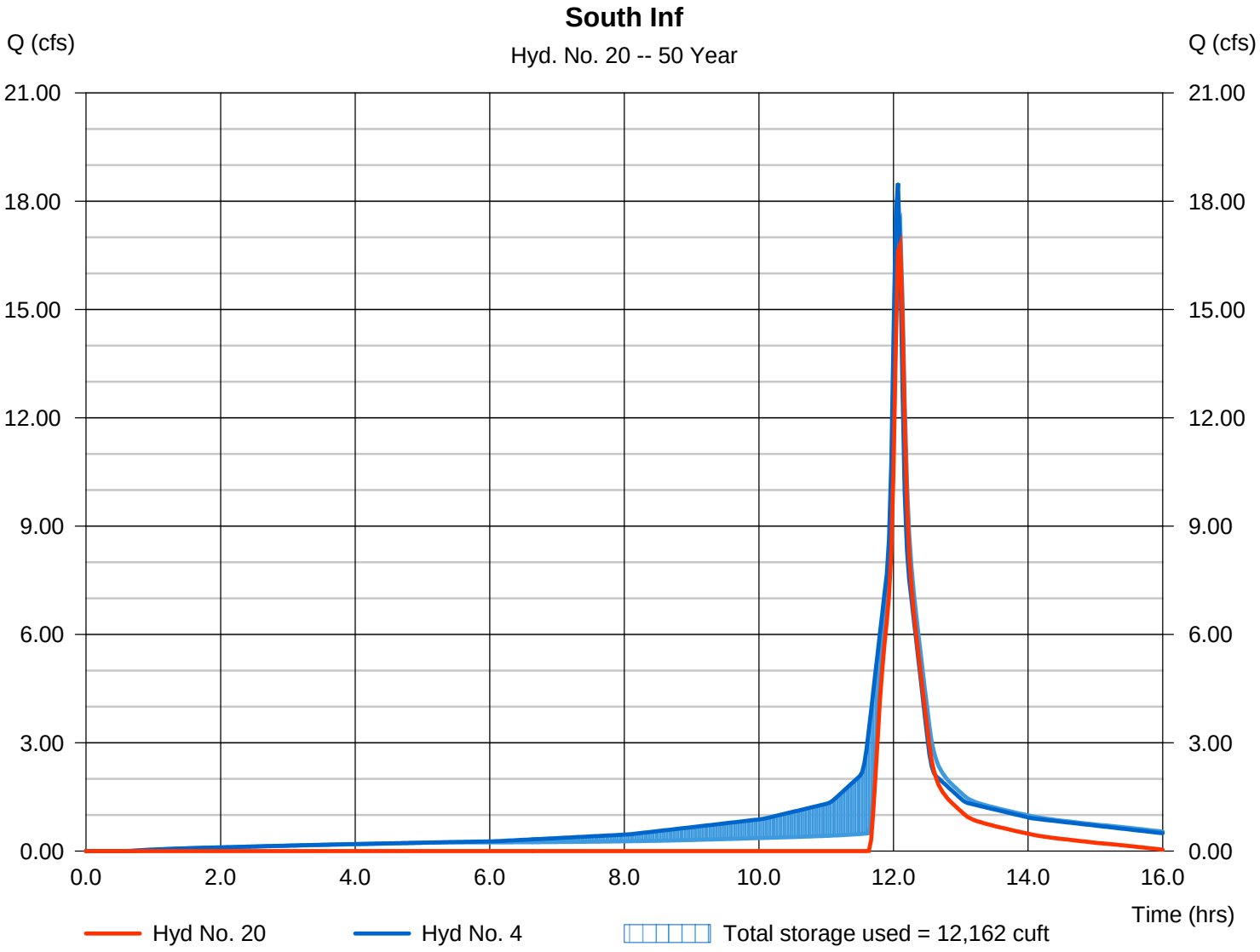
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 20

South Inf

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 16.79 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 12.10 hrs |
| Time interval | = | 2 min | Hyd. volume | = | 29,924 cuft |
| Inflow hyd. No. | = | 4 - PR WS 03D | Max. Elevation | = | 44.46 ft |
| Reservoir name | = | SOUTH INF | Max. Storage | = | 12,162 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



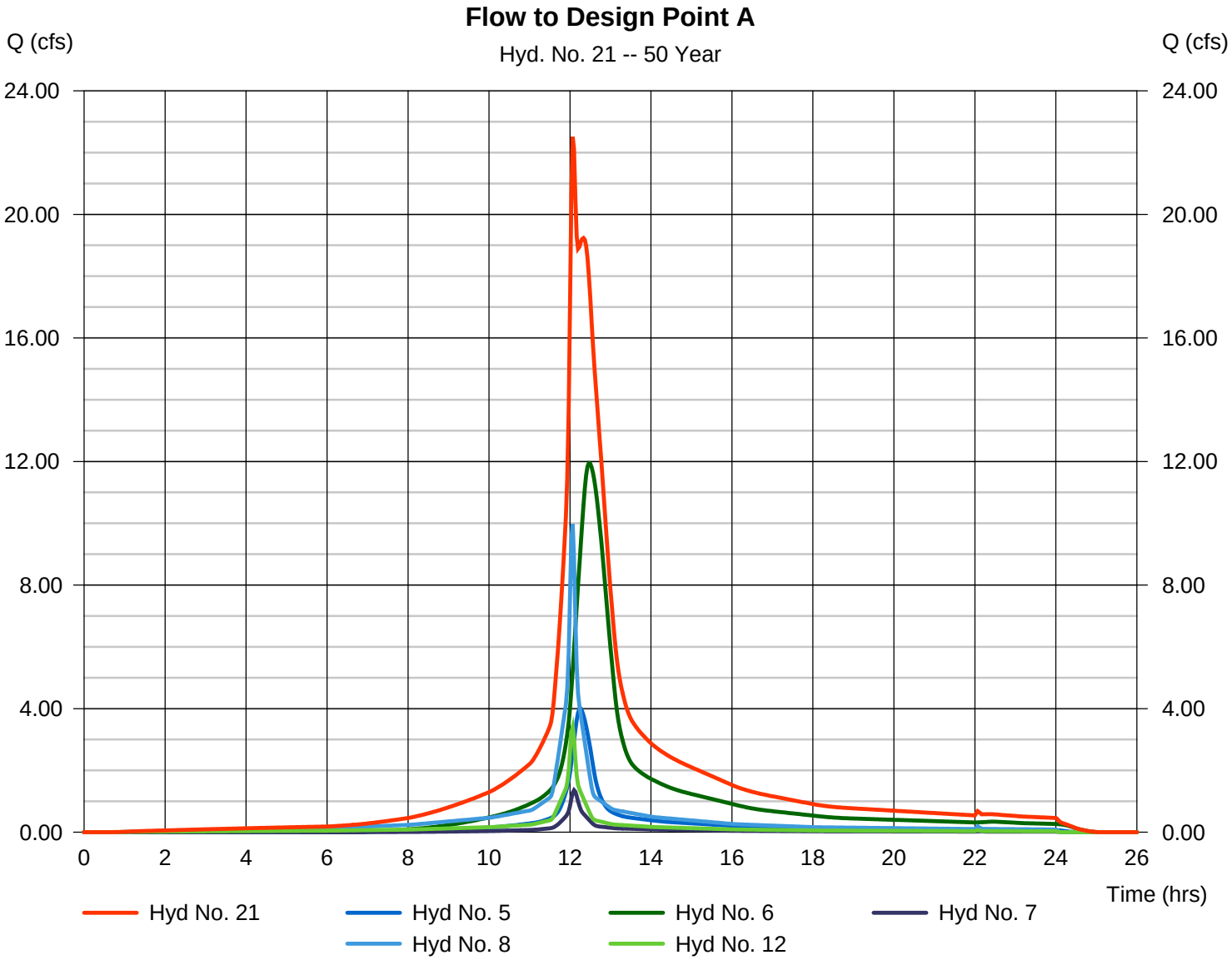
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 21

Flow to Design Point A

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 22.51 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 145,444 cuft |
| Inflow hyds. | = 5, 6, 7, 8, 12 | Contrib. drain. area | = 7.410 ac |



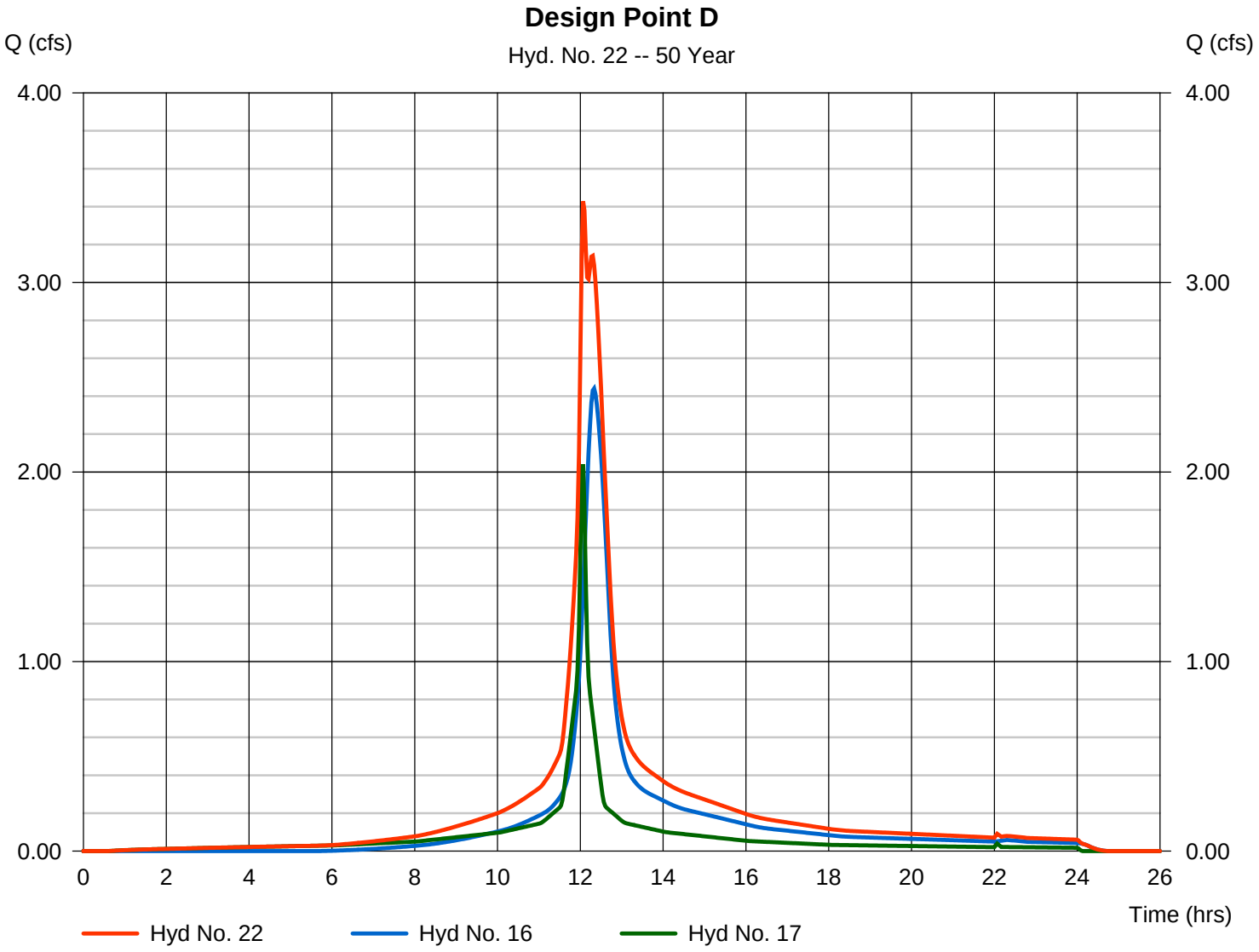
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 22

Design Point D

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 3.428 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 20,000 cuft |
| Inflow hyds. | = 16, 17 | Contrib. drain. area | = 0.971 ac |



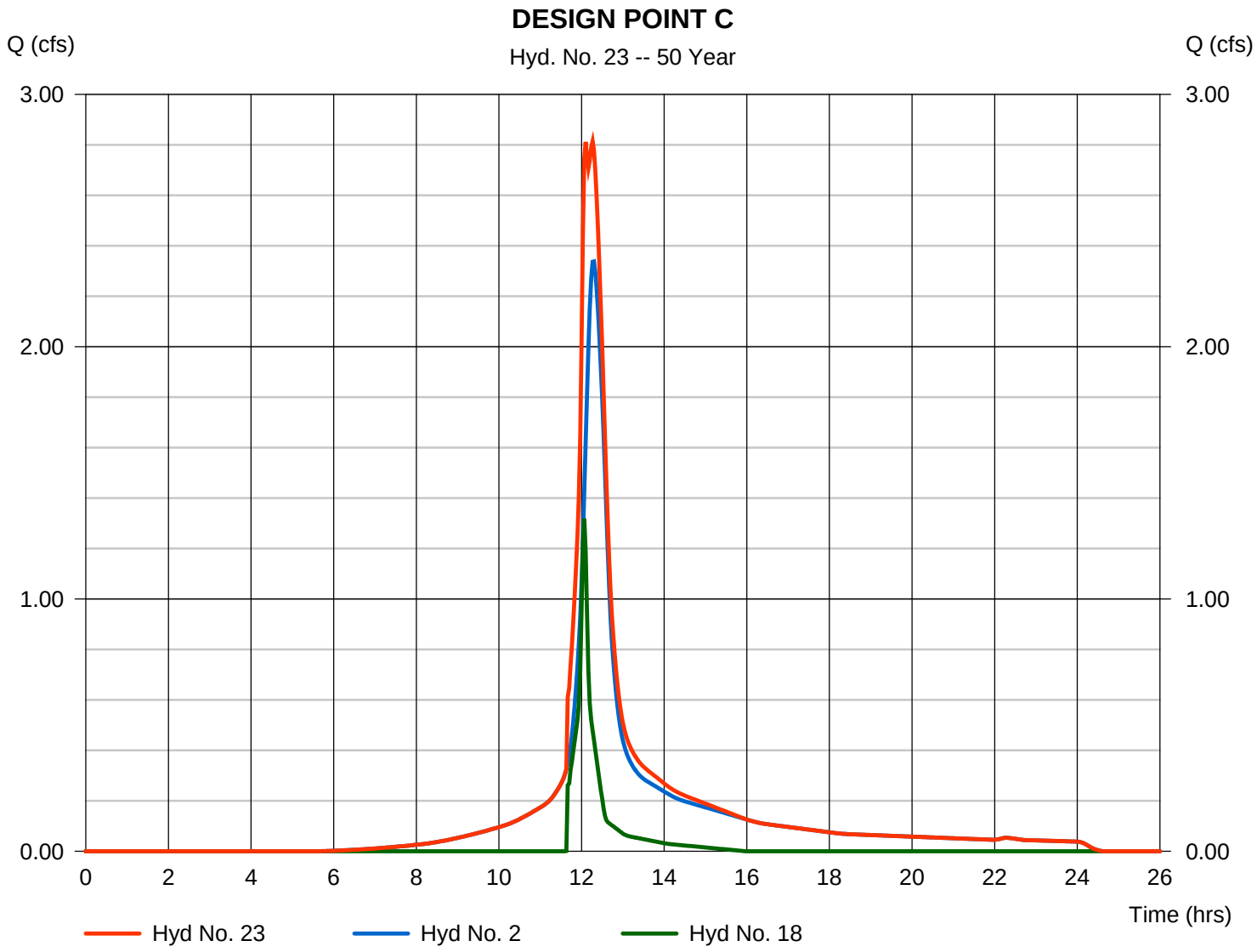
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 23

DESIGN POINT C

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 2.815 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.27 hrs |
| Time interval | = 2 min | Hyd. volume | = 13,874 cuft |
| Inflow hyds. | = 2, 18 | Contrib. drain. area | = 0.626 ac |



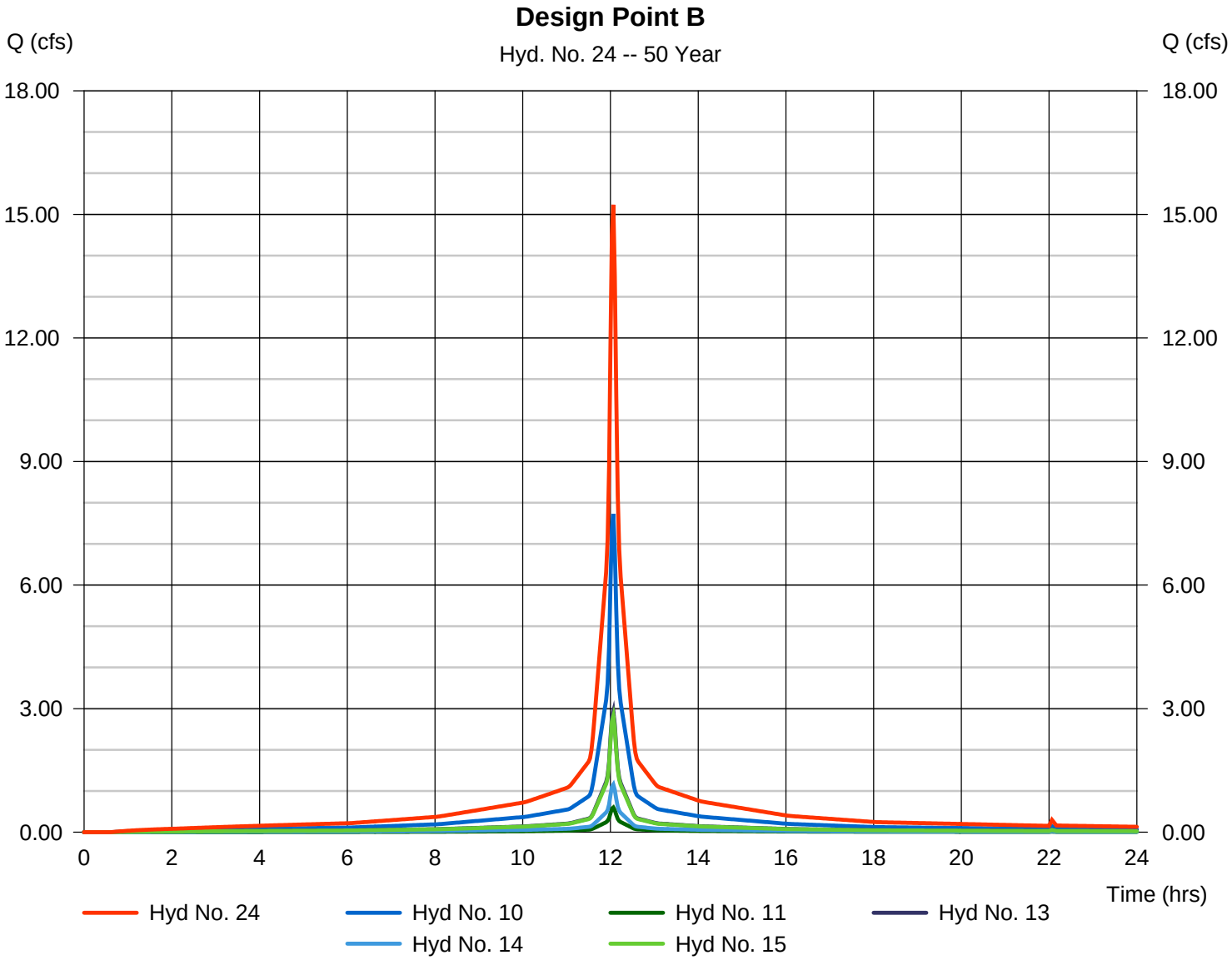
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 24

Design Point B

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 15.23 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 52,899 cuft |
| Inflow hyds. | = 10, 11, 13, 14, 15 | Contrib. drain. area | = 2.169 ac |



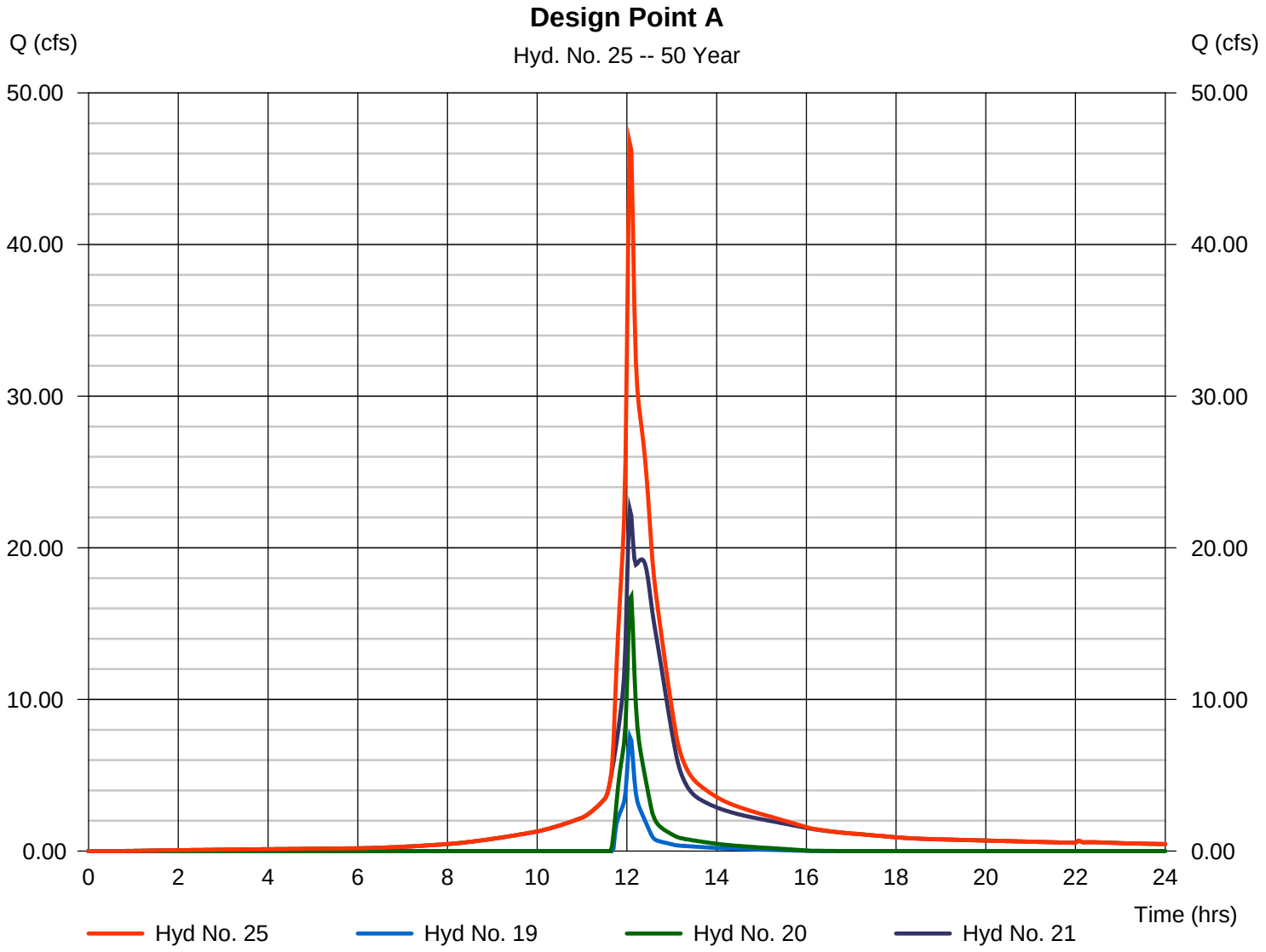
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 25

Design Point A

| | | | |
|---|---|---|---|
| Hydrograph type | = Combine | Peak discharge | = 46.65 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 12.07 hrs |
| Time interval | = 2 min | Hyd. volume | = 188,190 cuft |
| Inflow hyds. | = 19, 20, 21 | Contrib. drain. area | = 0.000 ac |



Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Baywater Corbin Drive**
Project Number: **B0509**
Project Location: **Darien, CT**
Description: **Water Quality Flow**
Prepared By: **PAR** Date: **April 24, 2018**

# WQS 02 (Vortechs 2000)

## Required Water Quality Volume (WQv)

| | | |
|---|---|---|
| Total Area in acres (A) | = | 1.992 |
| Impervious Area in acres | = | 1.992 |
| Pecenct of Impervious Area (I) | = | 100 |
| Volumetric Runoff Coefficient (R) | | |

$R = 0.05+0.009(I)$ = 0.950

$WQv = \frac{(1")(R)(A)}{12}$ = **0.1577 ac*ft** = **6869 cf**

## Required Water Quality Flow (WQf)

| | | |
|---|---|---|
| WQv (Ac*ft) | = | 0.1577 |
| Drainage Area (Ac) | = | 1.992 |

**Q= WQv*12 / DA** = **0.950 in**

| | | |
|---|---|---|
| Runoff Depth in inches (Q) | = | **0.950** in |
| Design Precipitation in inches (P) | = | **1.0** in |

**$CN=1000/[10+5*P+10Q-10*(Q^2+1.25QP)^{1/2}]$** = **100 CN**

From table 4-1 in chapter 4, TR-55

$I_a$ = **0.041 in**
$I_a / P$ = **0.041**

From Exhibit 4-11 in chapter 4, TR-55

$q_u$ = **650 csm/in**

| | | |
|---|---|---|
| Unit peak discharge in csm/in ($q_u$) | = | **650** |
| Area in square miles (A) | = | **0.003** |
| Runoff Depth in inches (Q) | = | **0.950** |

**$WQF=q_u*A*Q$** = **1.922 cfs**

*Calculated in accordence with the 2004 Connecticut Stormwater Quality Manual Sections 7.4.1 and 7.4.2*

# Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Aug 30 2018

## VORTECH FLOW

**Circular**

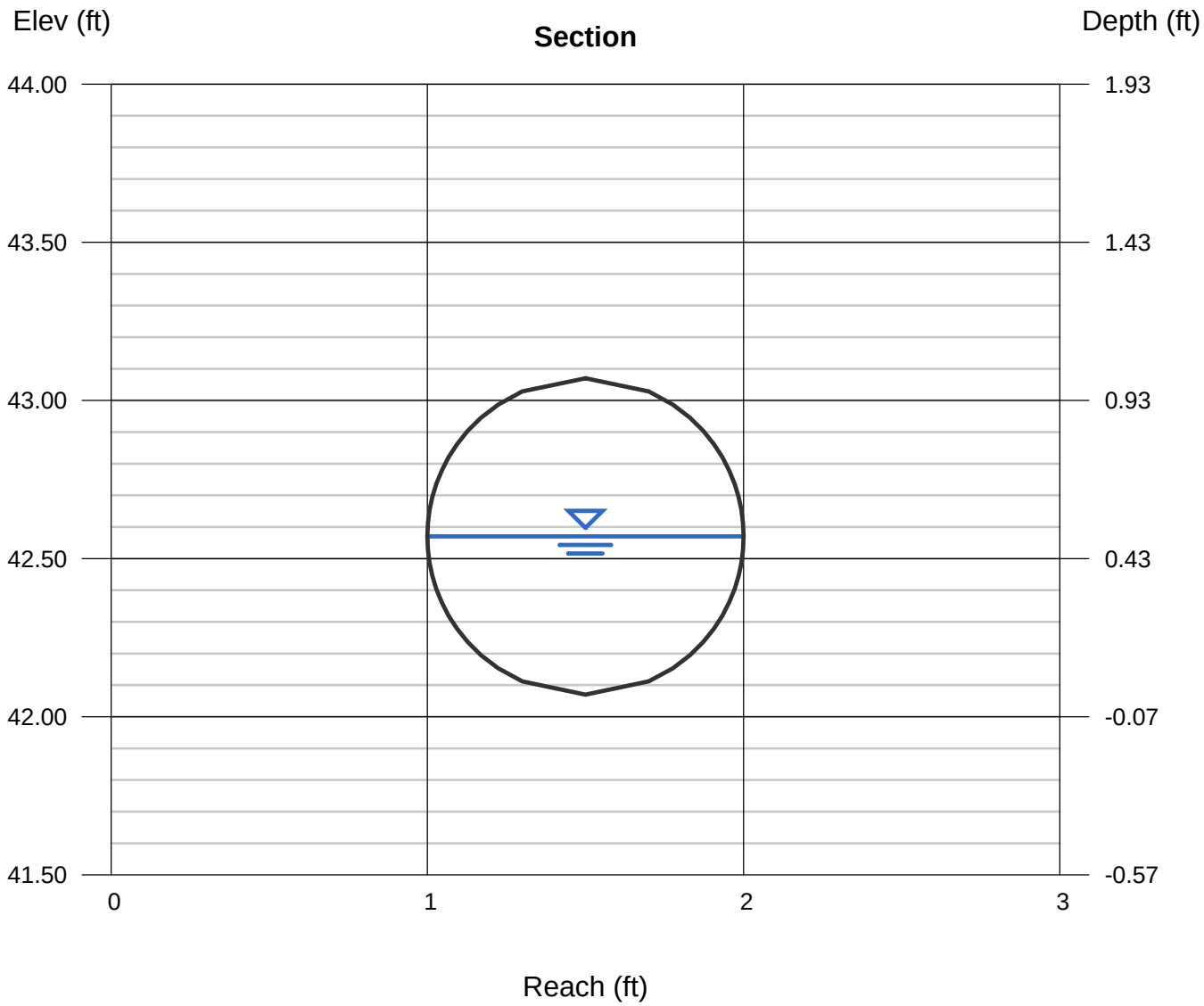
| | |
|---|---|
| Diameter (ft) | = 1.00 |
| Invert Elev (ft) | = 42.07 |
| Slope (%) | = 1.00 |
| N-Value | = 0.012 |

**Calculations**

| | |
|---|---|
| Compute by: | Known Q |
| Known Q (cfs) | = 1.92 |

**Highlighted**

| | |
|---|---|
| Depth (ft) | = 0.50 |
| Q (cfs) | = 1.922 |
| Area (sqft) | = 0.39 |
| Velocity (ft/s) | = 4.87 |
| Wetted Perim (ft) | = 1.57 |
| Crit Depth, Yc (ft) | = 0.59 |
| Top Width (ft) | = 1.00 |
| EGL (ft) | = 0.87 |



Tighe&Bond

# ATTACHMENT C

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Baywater Corbin Drive**
Project Number: **B0509**
Project Location: **Darien, CT**
Description: **Water Quality Flow**
Prepared By: **PAR** Date: **April 24, 2018**

# Water Quality Basin
## Required Water Quality Volume (WQv)

| | | |
|---|---|---|
| Total Area in acres (A) | = | 1.187 |
| Impervious Area in acres | = | 1.150 |
| Pecenct of Impervious Area (I) | = | 97 |
| Volumetric Runoff Coefficient (R) | | |

$R = 0.05+0.009(I)$ = 0.922

$WQv = \frac{(1")(R)(A)}{12}$ = **0.0912 ac*ft** = **3972 cf**

Storage Provided = 4090 cf
Previous Storage Provided = 4200 cf

## Required Water Quality Flow (WQf)

| | | |
|---|---|---|
| WQv (Ac*ft) | = | 0.0912 |
| Drainage Area (Ac) | = | 1.187 |

**Q= WQv*12 / DA** = **0.922 in**

| | | |
|---|---|---|
| Runoff Depth in inches (Q) | = | **0.922** in |
| Design Precipitation in inches (P) | = | **1** in |

$CN=1000/[10+5*P+10Q-10*(Q^2+1.25QP)^{1/2}$ = **99 CN**

From table 4-1 in chapter 4, TR-55

$I_a$ = **0.041 in**
$I_a$ / P = **0.041**

From Exhibit 4-11 in chapter 4, TR-55

$q_u$ = **300 csm/in**

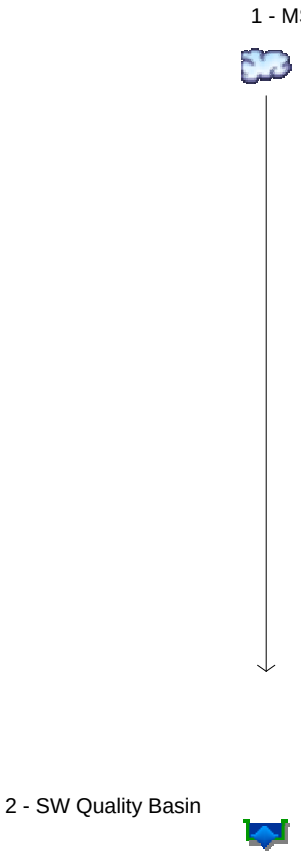
| | | |
|---|---|---|
| Unit peak discharge in csm/in ($q_u$) | = | **300** |
| Area in square miles (A) | = | **0.002** |
| Runoff Depth in inches (Q) | = | **0.922** |

**$WQF=q_u*A*Q$** = **0.513 cfs**

*WQV is based on impervious site coverage

# Watershed Model Schematic





# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SCS Runoff | 14.25 | 2 | 730 | 58,455 | ------ | ------ | ------ | MS-170A |
| 2 | Reservoir | 13.94 | 2 | 732 | 48,759 | 1 | 38.22 | 5,268 | SW Quality Basin |

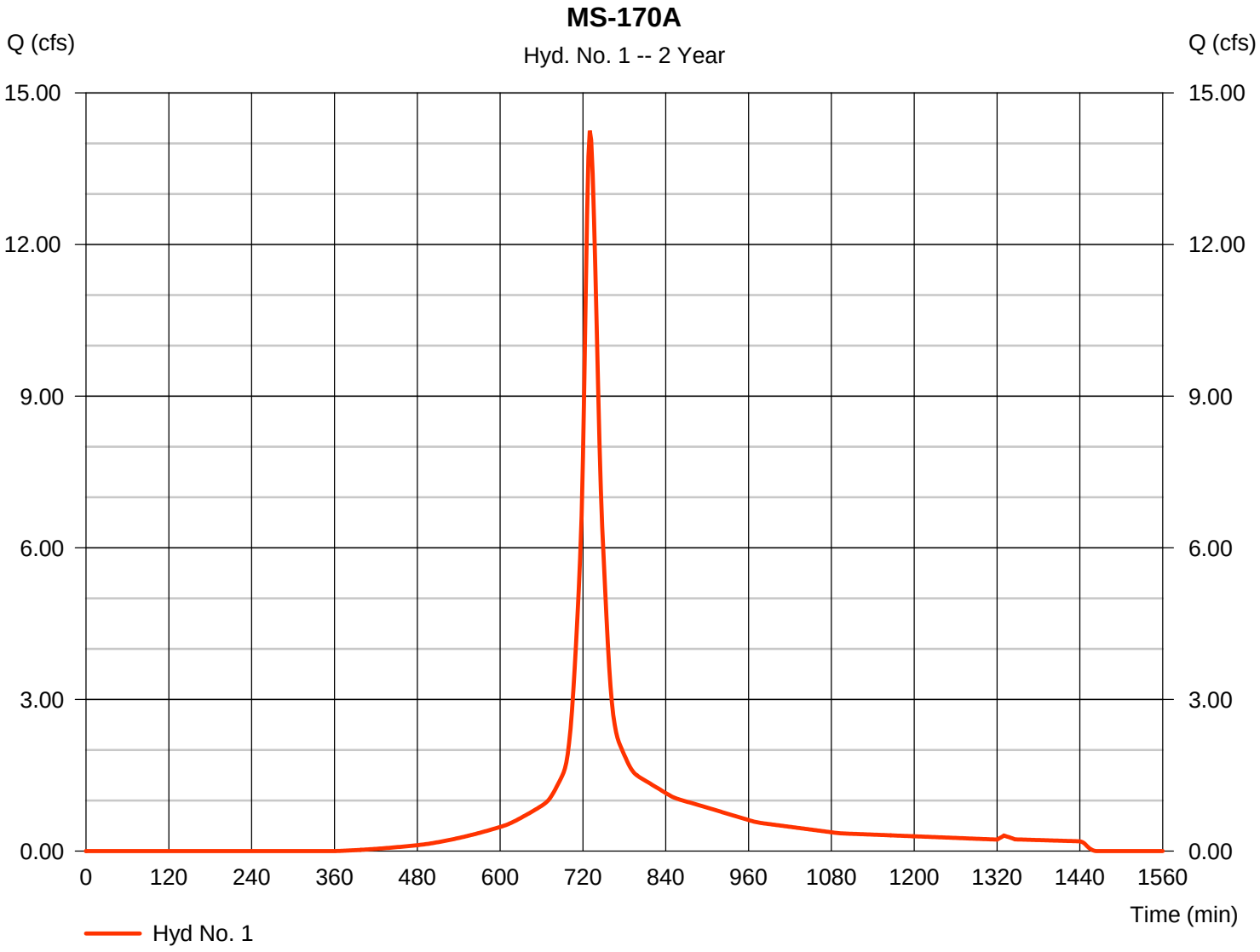
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 1

MS-170A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 14.25 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 730 min |
| Time interval | = 2 min | Hyd. volume | = 58,455 cuft |
| Drainage area | = 6.872 ac | Curve number | = 89 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 15.00 min |
| Total precip. | = 3.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



# Hydrograph Report

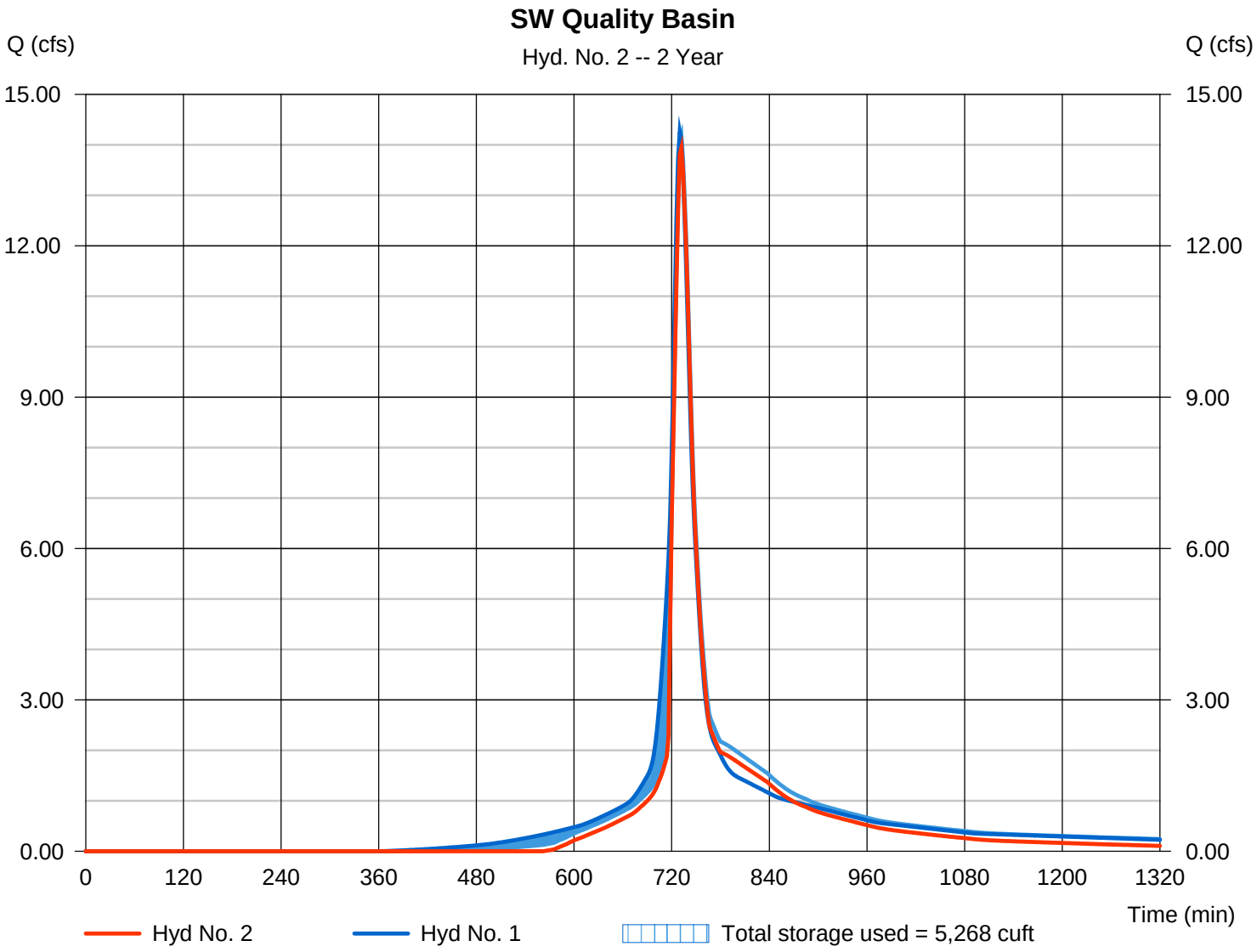
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 2

SW Quality Basin

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 13.94 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 732 min |
| Time interval | = | 2 min | Hyd. volume | = | 48,759 cuft |
| Inflow hyd. No. | = | 1 - MS-170A | Max. Elevation | = | 38.22 ft |
| Reservoir name | = | Basin #1 | Max. Storage | = | 5,268 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Pond No. 1 - Basin #1

### Pond Data

**Contours -**User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 35.25 ft

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 35.25 | 1,147 | 0 | 0 |
| 0.75 | 36.00 | 1,372 | 943 | 943 |
| 1.75 | 37.00 | 1,896 | 1,627 | 2,570 |
| 2.75 | 38.00 | 2,434 | 2,159 | 4,729 |
| 4.75 | 40.00 | 2,434 | 4,868 | 9,597 |

### Culvert / Orifice Structures

| | [A] | [B] | [C] | [PrfRsr] |
|---|---|---|---|---|
| **Rise (in)** | = 36.00 | 8.00 | 0.00 | 0.00 |
| **Span (in)** | = 48.00 | 8.00 | 0.00 | 0.00 |
| **No. Barrels** | = 1 | 1 | 0 | 0 |
| **Invert El. (ft)** | = 36.00 | 36.00 | 0.00 | 0.00 |
| **Length (ft)** | = 100.00 | 0.00 | 0.00 | 0.00 |
| **Slope (%)** | = 2.00 | 0.00 | 0.00 | n/a |
| **N-Value** | = .015 | .013 | .013 | n/a |
| **Orifice Coeff.** | = 0.60 | 0.60 | 0.60 | 0.60 |
| **Multi-Stage** | = n/a | Yes | No | No |

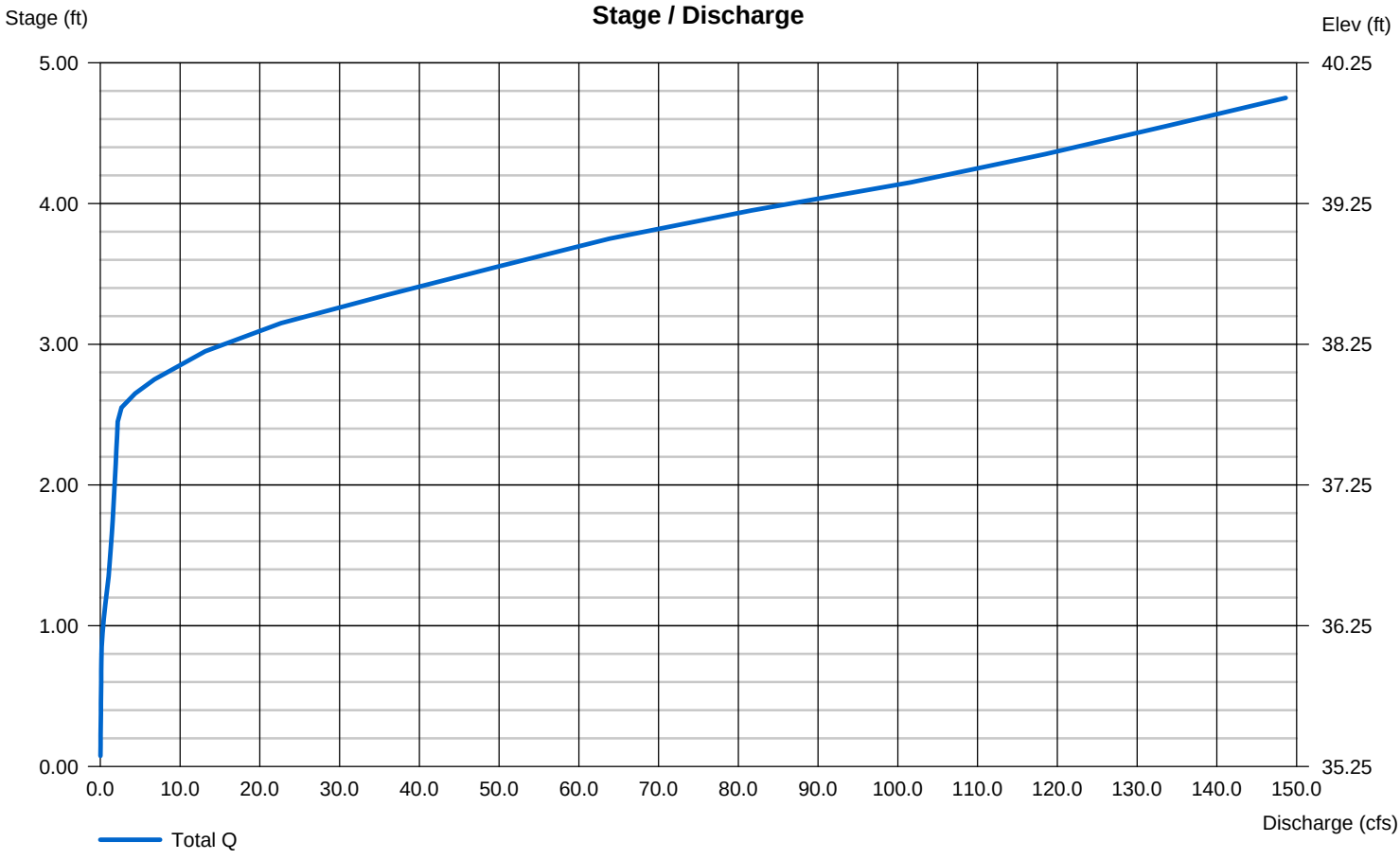
### Weir Structures

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| **Crest Len (ft)** | = 18.00 | 11.00 | 10.00 | 0.00 |
| **Crest El. (ft)** | = 39.00 | 37.75 | 38.25 | 0.00 |
| **Weir Coeff.** | = 3.33 | 3.33 | 2.60 | 3.33 |
| **Weir Type** | = Rect | Ciplti | Broad | --- |
| **Multi-Stage** | = Yes | Yes | No | No |

**Exfil.(in/hr)** = 4.000 (by Contour)

**TW Elev. (ft)** = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SCS Runoff | 24.13 | 2 | 730 | 101,080 | ------ | ------ | ------ | MS-170A |
| 2 | Reservoir | 23.80 | 2 | 730 | 89,773 | 1 | 38.42 | 5,753 | SW Quality Basin |

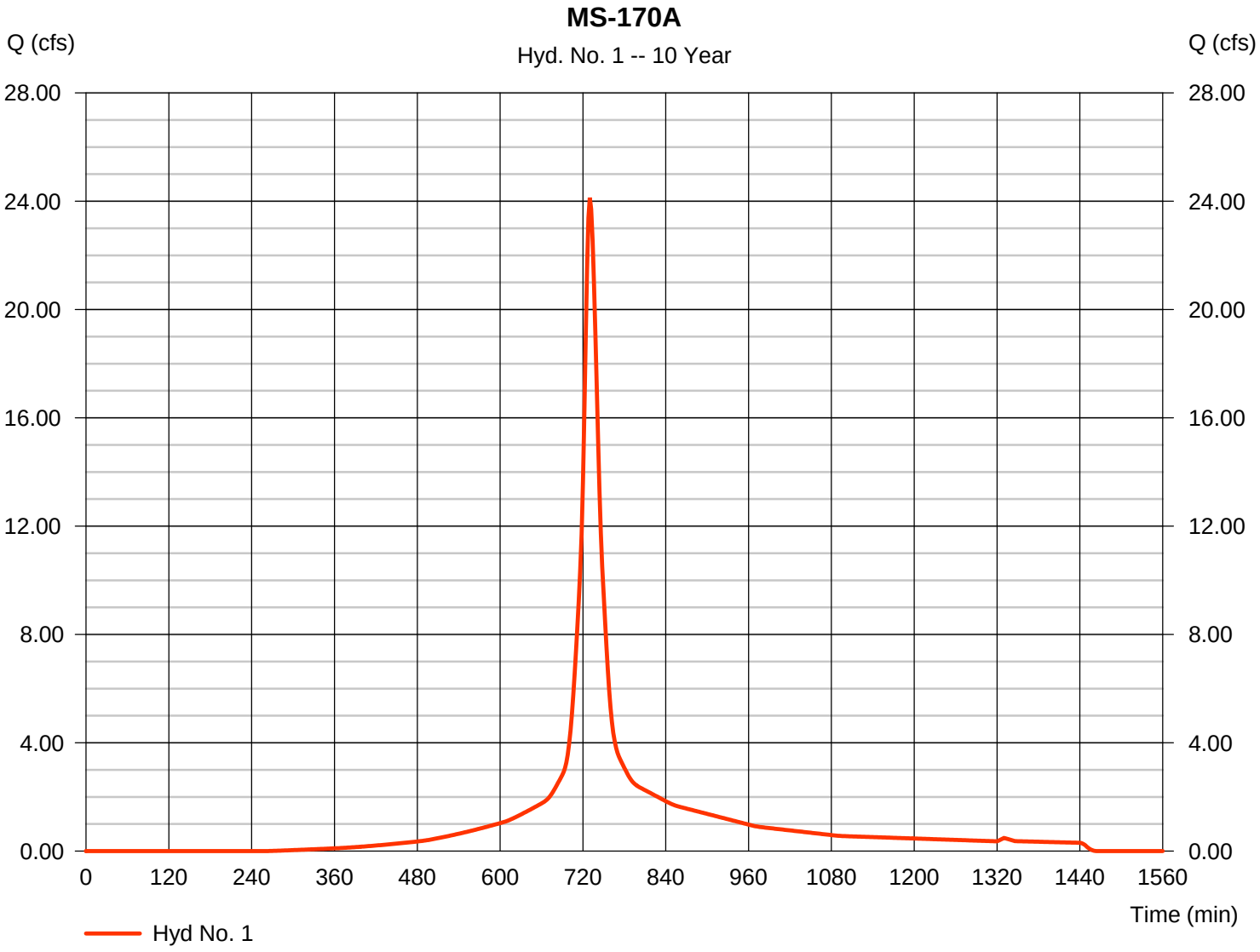
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 1

MS-170A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 24.13 cfs |
| Storm frequency | = 10 yrs | Time to peak | = 730 min |
| Time interval | = 2 min | Hyd. volume | = 101,080 cuft |
| Drainage area | = 6.872 ac | Curve number | = 89 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 15.00 min |
| Total precip. | = 5.40 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



# Hydrograph Report

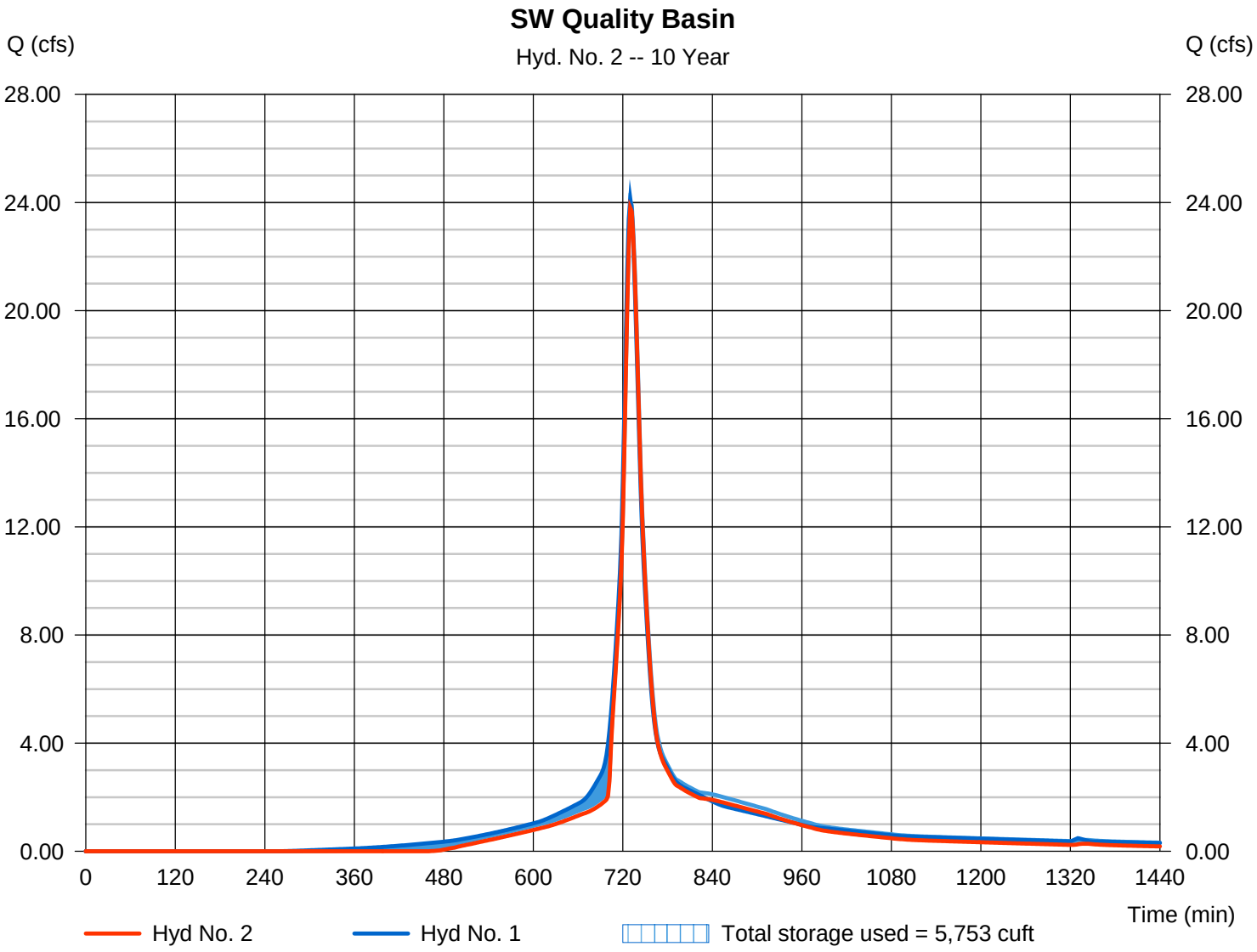
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 Wednesday, 08 / 29 / 2018

## Hyd. No. 2

SW Quality Basin

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 23.80 cfs |
| Storm frequency | = | 10 yrs | Time to peak | = | 730 min |
| Time interval | = | 2 min | Hyd. volume | = | 89,773 cuft |
| Inflow hyd. No. | = | 1 - MS-170A | Max. Elevation | = | 38.42 ft |
| Reservoir name | = | Basin #1 | Max. Storage | = | 5,753 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SCS Runoff | 30.23 | 2 | 730 | 128,163 | ------ | ------ | ------ | MS-170A |
| 2 | Reservoir | 29.83 | 2 | 730 | 116,038 | 1 | 38.52 | 5,974 | SW Quality Basin |

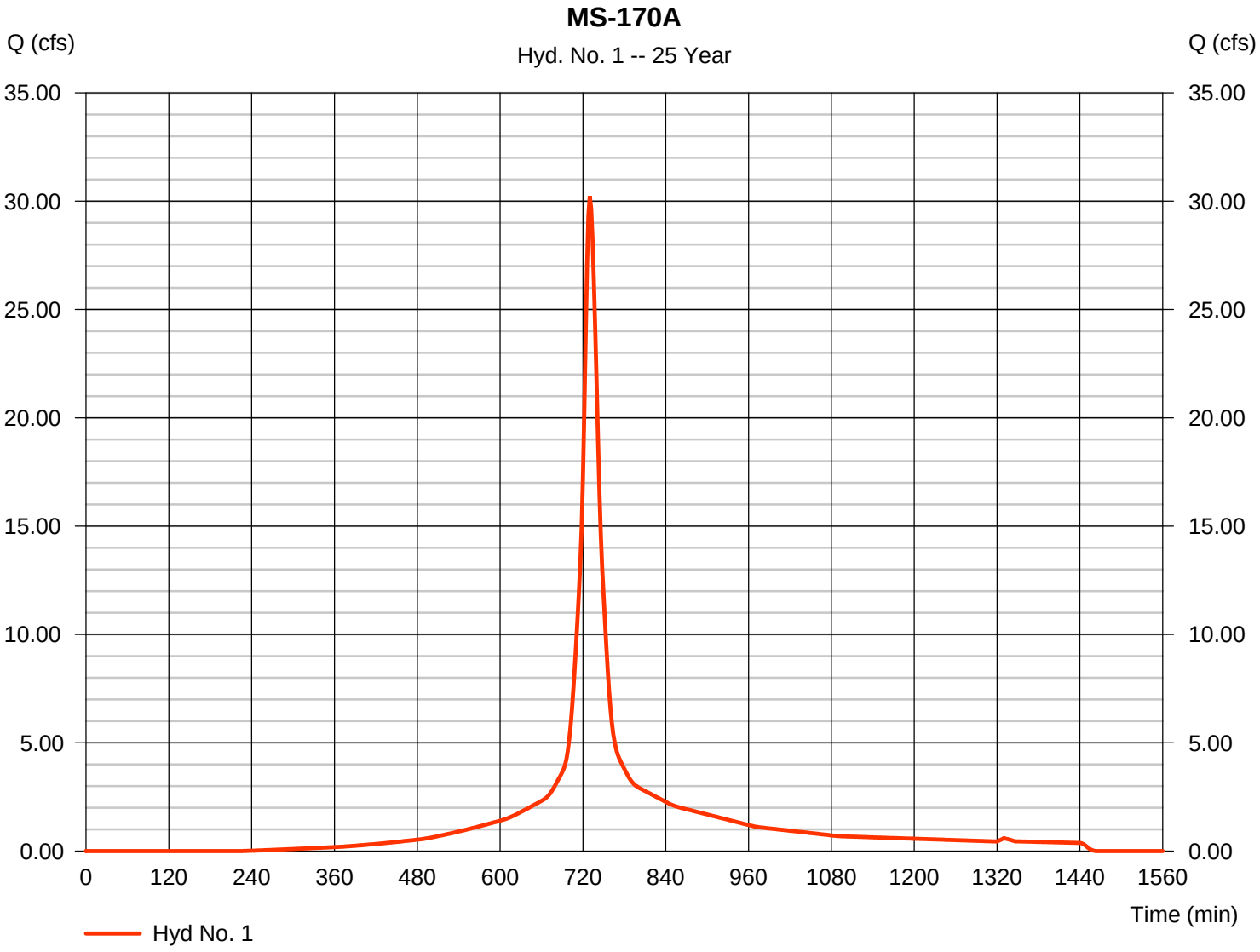
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 1

MS-170A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 30.23 cfs |
| Storm frequency | = 25 yrs | Time to peak | = 730 min |
| Time interval | = 2 min | Hyd. volume | = 128,163 cuft |
| Drainage area | = 6.872 ac | Curve number | = 89 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 15.00 min |
| Total precip. | = 6.55 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



# Hydrograph Report

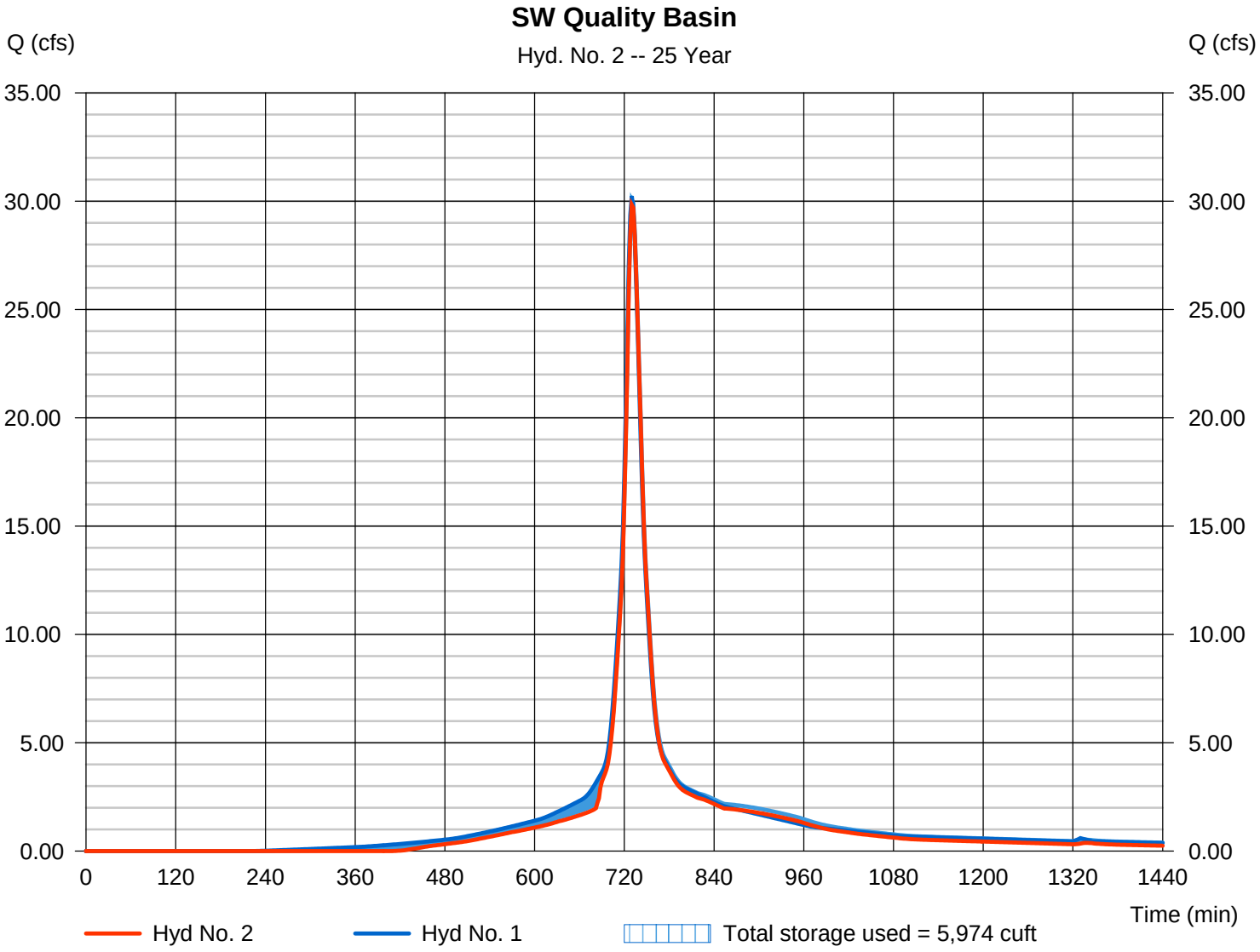
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 2

SW Quality Basin

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 29.83 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 730 min |
| Time interval | = | 2 min | Hyd. volume | = | 116,038 cuft |
| Inflow hyd. No. | = | 1 - MS-170A | Max. Elevation | = | 38.52 ft |
| Reservoir name | = | Basin #1 | Max. Storage | = | 5,974 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

| Hyd. No. | Hydrograph type (origin) | Peak flow (cfs) | Time interval (min) | Time to Peak (min) | Hyd. volume (cuft) | Inflow hyd(s) | Maximum elevation (ft) | Total strge used (cuft) | Hydrograph Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SCS Runoff | 34.93 | 2 | 730 | 149,289 | ------ | ------ | ------ | MS-170A |
| 2 | Reservoir | 34.50 | 2 | 730 | 136,608 | 1 | 38.59 | 6,146 | SW Quality Basin |

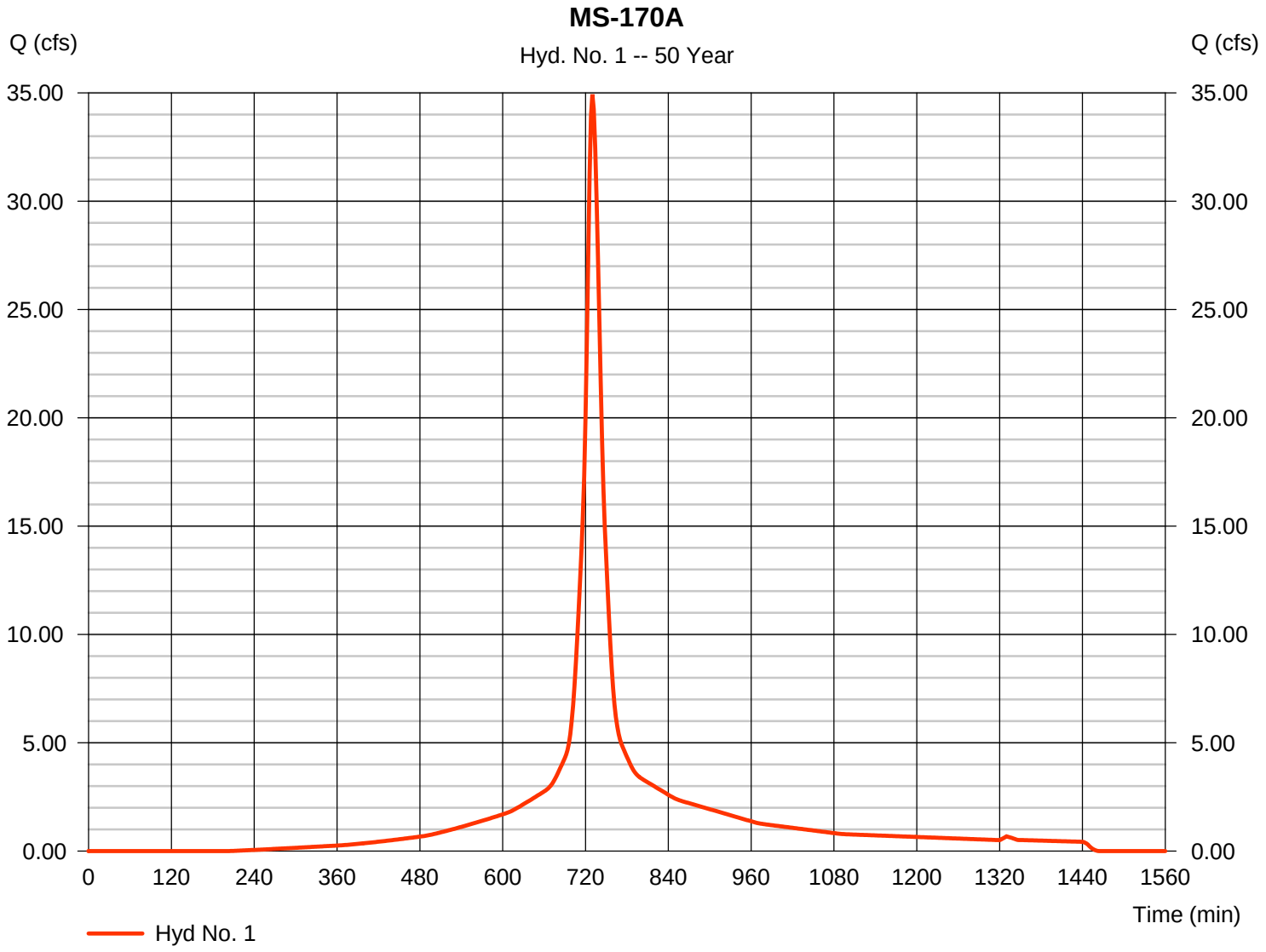
# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 1

MS-170A

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 34.93 cfs |
| Storm frequency | = 50 yrs | Time to peak | = 730 min |
| Time interval | = 2 min | Hyd. volume | = 149,289 cuft |
| Drainage area | = 6.872 ac | Curve number | = 89 |
| Basin Slope | = 0.0 % | Hydraulic length | = 0 ft |
| Tc method | = User | Time of conc. (Tc) | = 15.00 min |
| Total precip. | = 7.44 in | Distribution | = Type III |
| Storm duration | = 24 hrs | Shape factor | = 484 |



# Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12 — Wednesday, 08 / 29 / 2018

## Hyd. No. 2

SW Quality Basin

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 34.50 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 730 min |
| Time interval | = | 2 min | Hyd. volume | = | 136,608 cuft |
| Inflow hyd. No. | = | 1 - MS-170A | Max. Elevation | = | 38.59 ft |
| Reservoir name | = | Basin #1 | Max. Storage | = | 6,146 cuft |

Storage Indication method used. Exfiltration extracted from Outflow.